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POLLUTION OF LAKE MICHIGAN AND ITS TRIBUTARY BASIN - ILLINOIS, INDIANA, MICHIGAN, AND WISCONSIN. PROCEEDINGS OF CONFERENCE, SECOND SESSION, HELD AT CHICAGO, ILLINOIS ON FEBRUARY 25, 1969. VOLUME 1

Federal Water Pollution Control Administration
Washington, D. C.

25 February 1969

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PROCEEDINGS

Volume 1

ILLINOIS
INDIANA

Second Session
February 25, 1969
Chicago, Illinois

CONFERENCE

Pollution of Lake Michigan and its Tributary Basin, Illinois, Indiana, Michigan, and Wisconsin

U.S. Department of the Interior • Federal Water Pollution Control Administration

SECOND SESSION
OF THE
CONFERENCE
IN THE MATTER OF POLLUTION OF LAKE MICHIGAN AND ITS TRIBUTARY BASIN

held in

Chicago, Illinois

February 25, 1969

TRANSCRIPT OF PROCEEDINGS

VOLUME I

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The Second Session of the Conference on the Matter of Pollution of Lake Michigan, and its Tributary Basin, convened at 9:30 o'clock a.m., on February 25, 1969, at the Sherman House, Chicago, Illinois.

PRESIDING:

Mr. Murray Stein
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Indianapolis, Indiana

Thomas G. Frangos
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ALSO PRESENT:

John E. Egan
President
Metropolitan Sanitary District
of Greater Chicago
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General Manager
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Ensign Martin P. Clark
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Wisconsin Department of Natural Resources
Madison, Wisconsin

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Fifth U. S. Army
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Education Chairman on Lake Michigan Pollution
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- - -

PROCEEDINGS

OPENING STATEMENT
BY
MR. MURRAY STEIN

MR. STEIN: The Conference is open.

This session of the Conference in the matter of pollution of Lake Michigan and its tributary basin waters in the States of Wisconsin, Illinois, Indiana, and Michigan is being held under the provisions of Section 10 of the Federal Water Pollution Control Act, as amended.

At the first session of this Conference, the Conferees, in a splendid demonstration of State-Federal-local-industrial cooperative action, came up with a very ambitious program to stop pollution in Lake Michigan and save the water quality of Lake Michigan. Perhaps the ambitious program was called for by the problem that we faced and that heroic measures were needed to save Lake Michigan.

Of course, we have the question of controlling municipal and industrial wastes and again let me point out some of the essential facts as we found them. The large sources of pollution in Lake Michigan were and remain the industrial and municipal waste sources. However, if we are going to save the lake, in addition to those, we have many, many other problems. We are going to have statements dealing with the dredging problem, agricultural programs to prevent pollution, Federal installations, wastes from watercraft, nuclear discharges and thermal pollution, the pesticide problem, monitoring, etc. All these problems should be looked at in perspective so we can understand what we are doing. Because of the combination program we have had to take with the lake, we are getting at some of these newer problems that I have outlined. These problems may take up quite a bit of time in the discussion. But just because they take up this time because they are new and we are looking for ways of solutions, we should not lose sight of the fact that the large sources of pollution in the lake are the municipal and industrial sources. Unless these are controlled we are not going to save the lake and we have to see how well we are doing on these.

The Conferees, as you know, represent the four States of the lake and the Federal Government.

The Wisconsin Department of Natural Resources will be represented by Mr. Lester P. Voigt and Mr. Thomas Frangos.

The Illinois State Sanitary Water Board will be represented by Mr. Clarence W. Klassen.

The Indiana Stream Pollution Control Boar is represented by Mr. Blucher A. Poole.

The Conferee for the Michigan Resources Commission is Mr. Ralph W. Purdy. This is the first time we have welcomed Mr. Purdy in his capacity as the chief professional man on the Michigan Water Resources Commission. At this time I would like to extend the thanks of the Conferees, and I think we might say the entire country, for the tremendous work and contribution made during the years by the predecessor of Mr. Purdy, Mr. Loring Oeming, who has not only been active in state water pollution control work and regional work, but he has been a consultant to the Federal Government in many of the problems that we have had and has shaped, literally shaped, the national program in water pollution control.

The Federal Conferee is Mr. H. W. Poston, who is Director for this region of the Federal Water Pollution Control Administration, United States Department of the Interior with headquarters in Chicago.

And my name is Murray Stein. I am from headquarters of the Federal Water Pollution Control Administration in Washington and the representative of Secretary Hickel.

We are going to make an attempt, because of the commitments of some of the Conferees, to finish this session of the Conference today, if possible. This will require the cooperation from all concerned, because, as you know, we are not going to cut anybody off. So if we are going to finish today, it will require voluntary restraint.

There has been an agenda distributed to the Conferees, and we will follow this agenda. Of course,we will be open to modifications of the agenda.

Let me indicate briefly for the people in the audience what is coming up.

First, the United States Corps of Engineers, dredging program.

Next, statements of Illinois, Indiana, Michigan, Wisconsin.

Then the three agricultural programs to prevent pollution, a statement by the United States Department of Agriculture.

Four, status of wastes of Federal installations.

Five, research on pressing water pollution problems.

Six, uniform regulations to control wastes from watercraft.

Seven, nuclear discharges and thermal pollution.

Eight, pesticide problem evaluation.

Nine, coordinated monitoring program.

Ten, municipal and industrial discharges and detailed action planned.

Conferees review and consideration.

These are subject to modification, and I take a deep breath at this because you recognize if we are going to conclude in one day, we have our work cut out for us.

To start, at the first we will call on Mr. Poston.

Mr. Poston.

MR. POSTON: Mr. Chairman, I would call on Gen. Tarbox at this time to make a presentation to us. Gen. Tarbox is Division Engineer of the Corps of Engineers, headquartered here in Chicago.

STATEMENT BY BRIGADIER GENERAL
ROBERT M. TARBOX, NORTH CENTRAL DIVISION
ENGINEER, U. S. ARMY CORPS OF ENGINEERS,
CHICAGO, ILLINOIS

GEN. TARBOX: Thank you, Mr. Poston.

Chairman Stein, Gentlemen:

It is a pleasure to be with you today in response to your invitation to report to you on what the U. S. Army Corps of Engineers has done to develop methods of disposal of polluted dredgings so that they will not have an adverse effect on the water quality of Lake Michigan. As you will recall, Recommendation No. 11 of the Report of the Enforcement Conference on February 1968 states:

> "The prohibition of the dumping of polluted material into Lake Michigan is to be accomplished as soon as possible. The Corps of Engineers and the States are requested to report to the Conferees within six months concerning their program, at which time the Conferees will consider adopting a coordinated approach toward the disposal of dredged material together with a target date for getting the program into operation."

I believe that those of you who were here last year will recall that at that time I briefed you on what we were already doing to prevent our channel and harbor maintenance procedures from harming the Great Lakes; I told you of our plans for disposal of dredgings from Lake Michigan harbors during 1968; and I told you of our program for research and experimentation. This morning, I will briefly describe the latter again and then report on the progress that we have made during the past year.

In 1966, we requested funds to build diked enclosures at the 15 most polluted harbors on the Great Lakes and for the ensuing 10 years to deposit dredgings in these enclosures rather than in the open lake. However, we had no evidence to show that the beneficial results would be worth the 95 million dollars it would cost initially, plus the extra 3 million dollars in operational costs each year. Before asking the taxpayers to shoulder such a financial burden for such a program, the Bureau of the Budget asked the Corps, in cooperation with the Federal Water Pollution Control Administration and other agencies, to conduct an investigation into the whole dredgings disposal problem on the lakes. This study, which we have called our Pilot Program for Determining Alternate Methods of Disposal of Polluted Dredgings, has taken about two years and has cost about five and one half million dollars to date.

The Pilot Program study has been under the direction of our Buffalo District Engineer, Colonel

Amos L. Wright. Colonel Wright is here with me this morning. Our Detroit, Chicago, St. Paul and Lake Survey Districts have all assisted in the study. Mr. H. W. Poston, FWPCA Great Lakes Regional Program Director, is well familiar with the study, since personnel from his own office and from his area offices around the Great Lakes have worked with us.

We also engaged an independent Board of Consultants to help us develop our plan of study, to apply and study new approaches to the problems involved, and to evaluate the results. They took many field inspection trips, conferred frequently among themselves and with those directing the study, and significantly influenced the direction and scope of the investigations. You can see them in this picture. From the left--Dr. Alfred M. Beeton, biologist and Assistant Director of the University of Wisconsin's Center for Great Lakes Study; Dr. Gerard A. Rholich, Professor of Sanitary Engineering and Director of the University of Wisconsin Water Resources Center; Dr. Gordon M. Fair, Emeritus Professor of Sanitary Engineering at Harvard University; Professor Sanford S. Farness, of the Department of Urban Planning at Michigan

State University; and Dr. C. Fred Gurnham, Chemical Engineer, formerly with the Illinois Institute of Technology and now Vice President of Cyrus M. Rice, Consulting Engineers.

And we are fortunate to have Dr. Gurnham here with us this morning also.

Our program included extensive sampling studies, conducted principally by FWPCA, but with substantial participation by the Engineer Districts. They sampled dredged materials and the waters in the harbors where dredging takes place; in the open-lake areas where it is deposited, and in disposal areas of various kinds on shore, along shore and off shore. They found places where for some time dredgings have been used to fill enclosures and took samples from these older depositions. They analyzed the samples for physical characteristics; chemical content; toxic or other effects on plants, animal life and water quality; and as to appearance and odor. In addition, we contracted with the University of Wisconsin for functional studies to determine the effect of dredgings on the ecology of the lake disposal areas.

The Buffalo, Detroit and Chicago Engineer

Districts arranged with local interests for sites where diked enclosures might be built to receive dredgings; studied the possible use of such filled areas, along with the cost of their development; developed techniques for transferring the dredgings into the enclosure; and devised methods of placing the material in lake disposal areas so as to reduce adverse effects on the lake water quality.

Our Chicago Engineer District and the Chicago Metropolitan Sanitary District jointly experimented in processing material dredged from the Chicago River through the municipal sewage treatment system. Incidentally, this cooperative effort with MSD is typical of the cooperation we have received from many cities where our experiments took place, from the dredging industry and other industries and from other Federal agencies.

To endeavor to satisfy those who question the value of adopting costly alternate methods of dredge spoil disposal, we asked the Water Resources Center of the University of Illinois to evaluate the benefits to Great Lakes water quality that would result from various proposed disposal methods. As a part of this effort, the engineering consultant firm of Greeley and Hansen studied the measurable benefits to municipal and industrial water treatment plants.

The Buffalo District Engineer has completed a draft of his report, and it is being reviewed by the Board of Consultants. After we receive their advice, it will be submitted to the Chief of Engineers and the Federal Water Pollution Control Administrator. After their review, it will be coordinated with the governors of the eight Great Lakes states and with other interested persons. Finally, when the comments we receive have been considered and acted on, the report will be submitted to the Director of the Budget, who requested it, and subsequently to the Congress.

You can see that right now I cannot tell you what actions will be taken as a result of the findings of our study. However, I do want to tell you what some of Colonel Wright's findings are in his draft report. Incidentally, this will be the first time that they will have been made known to the public.

Before I tell you of the findings, let me try to dispel a couple of serious misconceptions that many people have, and I'll try to put this problem into the proper focus. Chairman Stein has already discussed that, but let me add a little bit to what he said. First, the Corps of Engineers would not fill up Lake Michigan if we did continue to put all of the dredgings in the authorized lake disposal areas. We dredge less than two million cubic yards from Lake Michigan harbors each year, and Lake Michigan has a total volume of six trillion cubic yards. At that rate it would take about three million years of dredging to fill up Lake Michigan. On the other hand, I'm sure you understand that the lake would be filled in the same three million years in the natural course of events if we did not dredge, since the sediments that enter a stream would be taken by flood flows right out into the lake. As it is now, they settle out before reaching the lake in the basins we form by our maintenance dredging each year.

Secondly, and this is a finding from the study report, dredgings form only a very small part of the sediment and pollution problems of the lakes. Indications are that less than about eight percent of the solids reaching Lake Michigan are dredging deposits, and of the total amount of pollutants introduced into Lake Michigan, those accompanying dredgings are of the same general magnitude. Naturally, to the degree that industries and municipalities improve treatment of what they discharge into the waterways, the amount of pollutants which settle to the bottom of the channels we dredge will diminish.

With a clearer understanding of the magnitude of the problem, let's look at the study findings.

1. Each harbor is unique. No single solution to dredgings disposal problems can be laid down for every harbor on the lake. The amount and kind of pollutants found in dredgings, the source of the pollutants, the practicality of controlling such sources, the availability of sites for alternate disposal--all of these vary widely between harbors. Conditions cannot be generalized for all the harbors nor should remedial policies and practices.

2. The effect on water quality of polluted sediments deposited in the Great Lakes remains unknown, despite much sampling and analytical work

during the progress of the study. The effects of the polluted dredgings on the quality of the surrounding lake waters could not be identified or measured.

3. Nevertheless, heavily polluted sediments from tributary streams, when they enter the lakes, must be considered presumptively undesirable because of their possible long-term effects on the ecology of the Great Lakes. Biological tests showed that polluted sediments are harmful to certain small forms of animal life found on the lake bottom.

4. Control of pollutants at the source will take time. No one can say how long it may take pollution abatement measures now under way to reduce materially the volume of pollutants that get into, and must be dredged from, harbor channels, although for the purposes of our study we assumed that appreciable relief might be felt in about ten years. By far the largest volume of sediment making its way into the lakes originates as soil erosion in the countryside. This sediment can carry varying amounts of noxious material in the form of decaying organic matter, fertilizer, pesticides and the like. It is unlikely that there will be a substantial

reduction in the amount of such sediments in the foreseeable future.

5. The benefits that would be derived by withholding from the lakes polluted sediments associated with dredgings are real, but they are intangible and not susceptible to objective evaluation. Perhaps the greatest benefit would be an increase in public confidence that something is being done.

6. Disposal in diked areas would be the least costly effective method of withholding from the lakes pollutants associated with dredgings.

7. The estimated costs for a program of diked disposal of polluted dredgings on all the Great Lakes for ten years would require an initial investment of about 70 million dollars, with annual operating costs increased by about 5 million dollars. For 18 polluted harbors on Lake Michigan, it would cost about $7 million initially and $2-1/2 million additional annually.

8. Justification for such a program would depend on subjective consideration of intangible benefits. The desirability of such a program would depend on the importance given to the intangible benefits.

9. It appears likely that a substantial portion of the additional costs of alternate disposal might have to be borne by local interests. Of course, the Congress will be the one to decide this point.

10. While the requirements for a ten-year program are being considered, with proper authority and funding we could start without delay an expedient program of diking to contain about two years dredging at a few of the worst problem areas. Indiana Harbor, Calumet River, Chicago River, Milwaukee and Green Bay Harbor would be included in both of these programs.

11. Present knowledge indicates that open lake disposal of non-polluted dredgings can be safely continued. Also, at some of the smaller harbors, open-lake disposal probably should be continued even though sediments are somewhat polluted, because of the small amount of dredgings, the high cost of alternate disposal, and the limited or uncertain benefits that would be derived from alternate disposal.

12. Studies should continue. We should conduct more and different tests at many harbors. We should study the dispersion of sediments in the lake, as

well as obtain more data on the overall loadings to each lake. Experimentation with disposal in underwater excavated areas and with harbor aerating and mixing may be productive.

In conclusion, I want you to know that we cannot and are not going to wait until the Pilot Program report is reviewed and acted on. The District Engineers and their staffs and I have been very active in telling everyone we can about the seriousness of the problem and what needs to be done. For example, last year I personally talked to the governor of each State participating in this Conference, as well as to governors of other Great Lakes States, and their staffs. The District Engineers have twice visited local authorities at each city where the FWPCA has said the harbor contains polluted sediments, to advise them of the problem and to solicit their help in obtaining areas for diked disposal. The District Engineers have further advised them that if we are not able to place the dredgings in the open water disposal areas and do not get additional appropriated funds to pay for the extra cost of alternate disposal, it might be preferable for them to provide the land for the diking, rather than for us not to be able to accomplish the required maintenance dredging. We have been gratified in almost every instance with their understanding of the problem, with their desire to participate and help provide alternate disposal areas, and with the effective response in many places. Where land disposal areas have been made available to us, we will use them. However, it is necessary that everyone concerned realize that we can go to a program of disposal of all polluted dredgings in diked areas only if we receive the authority and funds to do so, and that ultimately it will be Congress who makes that decision, along with the decision as to the division of costs between Federal and non-Federal interests.

Thank you, Mr. Stein.

MR. STEIN: Thank you, Gen. Tarbox.

Are there any comments or questions on this from the Conferees?

MR. POSTON: I would like to thank Gen. Tarbox for a very lucid statement on the work that he has been doing since our Conference approximately a year ago. I know that Gen. Tarbox has spent a lot of his own personal time on this and it has been one of his greatest concerns, and I appreciate very much the actions that he has undertaken.

GEN. TARBOX: I think we have a good partnership here, Mr. Poston.

MR. POSTON: Well, we haven't been as active as you have in this, and it isn't because we didn't want to, but there are other considerations.

MR. STEIN: Are there any other comments or questions?

I think we have had a very lucid statement of the problems and its study by the Corps, and Gen. Tarbox's statement has certainly outlined where we are going to go on this.

I think it is fair to say, General, that given the diverse views on what is to be done with dredging, I am not sure that we are going to get unanimity if we proceed with this report. However, all the problems are outlined very, very clearly.

As far as I can see it, this may boil down to a philosophic judgment that we have to make, and I think the General has outlined this in his second point where he says:

"The effect on water quality of polluted sediments deposited in the Great Lakes remains unknown, despite much sampling and analytical work during the progress of the study."

I think when all is said and done, this may be the key point if we are going to have an action program of decision in dealing with the dredgings within the reasonable foreseeable future or in our time. That is, if you are putting something in the lake the effects of which are unknown, do we--and when I say "we" I mean the taxpayer, this is the Federal Government, the States, the localities--want to spend the money to keep that out? Or do you want to take the chance of putting that in? This is where the program goes forward.

I think that the approach that the Corps is taking is a very, very sensible one and a very accurate one, in conjunction with Federal water pollution control agencies. That is, they are finding, as we have found in all pollution cases, that there is no simple solution--that you have to check **each harbor**. They have identified the dredgings which all parties considered to be polluted and are taking action to eliminate the disposal of those dredgings into the open lake and are putting them behind diked areas or on land.

The difficult question that comes up is after we have proceeded in this orderly manner what happens with the other dredgings? Do we spend the money to take that out just because we are putting in something that we are not quite sure of what the effect is? I think this is a very, very difficult question to answer.

And I am not speaking for the General and the Corps, but speaking for myself. As technicians, there comes a time when I think what we can do is present the issue as clearly as we can, in conjunction with our sister agency in water quality control, the Corps of Engineers, to the Bureau of the Budget, the Congress and the Governors of the States. Because I think the kind of judgment you are going to have here is a philosophic and a policy judgment of the highest order, where we have to determine what you are going to do in one of these cases.

I would like to emphasize this is the role of the Corps and ourselves. For myself, of course, I have been working with the Corps in various water projects for at least a quarter of a century. I think they have in this in the past proven that they can tackle new problems with alacrity and in a really organized and cooperative manner. We would like to thank Col. Wright for his work and also thank Gen. Tarbox for his efforts in backing this project.

Are there any other comments?

If not, I would like to again thank the General. As far as the recommendation the Conferees have made on the dredging problem, I would say that we are moving ahead according to schedule and the work that we planned is going forward.

MR. POSTON: I think we should accept Gen. Tarbox's report and that the Conferees should look forward to receiving his final report before setting a long-range policy by the Conferees, but that we should have a short-range policy--continue with a short-range policy--that we are going to keep all of the polluted dredged materials from being dumped into the lake.

MR. STEIN: Yes.

MR. POSTON: That is the way I--

MR. STEIN: I hoped that wouldn't be raised again. We are all agreed, aren't we, that the polluted dredged materials are to be kept out of the lake, except General Tarbox had some qualms that in these certain small harbors, because of the amount involved, what is classified as polluted dredged material should be considered on a case-by-case basis. This was the issue that General Tarbox raised. As for myself, I cannot see any easy solution to that. Another way to say the same thing is that there isn't any easy solution to phosphate removal when one considers phosphates from a real small city. This is also a problem we face continually.

In other words, while we have some general principles on this subject, the point that the General made--that each harbor must be considered by itself--will inevitably come up by itself and have to be decided on a case-by-case basis.

Are there any other comments on that?

Yes, Mr. Frangos.

MR. FRANGOS: Mr. Chairman, I am wondering if you or the Federal Conferee might review for all of us what the status of the interim agreement is between the FWPCA and the Corps?

MR. STEIN: Do you want to do that?

MR. FRANGOS: Did this expire or--

MR. POSTON: Maybe Gen. Tarbox would like to do that.

GEN. TARBOX: I just happen to have that with me.

MR. STEIN: Right. (Laughter.)

GEN. TARBOX: I think that you are referring, Mr. Frangos, to the announcement that was made in January which reviewed the Pilot Program studies to date and then gave this announcement, "Pending completion of the study, dredging will continue at other locations as necessary within the following restrictions." That is the agreement between the Corps and the Administration.

First, FWPCA will continue its sampling work to determine the pollutional characteristics of the various harbors.

Secondly, those harbors where the bottom materials are classified as unpolluted will continue to be dredged and the material placed in the approved open water lake disposal areas.

Third, dredging will be continued in those polluted harbors and channels where deferral of the dredging in 1969 would have a serious effect on the local, regional or national economy. Every effort will be exercised to reduce the volume of these dredgings to a minimum. In such cases monitoring and sampling of the waters in and around dredge and dump areas will be carefully accomplished by the joint effort of FWPCA and the Corps of Engineers to assure that effects of dumping are recorded and analyzed, to minimize interim deleterious effects, and to preclude contamination of any municipal water intakes and recreational beaches.

Fourth, the Corps of Engineers will continue to negotiate with State and local authorities in the Great Lakes area to identify and develop appropriate alternate disposal sites. As funds and sites can be made available by local interests, diked areas can be constructed for the more heavily polluted harbors and channels.

And fifth, since the Federal navigation channels which are maintained by the Corps of Engineers do not extend to the docks and slips of ports, additional complimentary dredging by non-Federal or private interests is necessary. The Corps of Engineers issues permits for such private dredging activities.

The same general principles concerning control of polluted dredge spoil on Federal projects will apply to private dredging.

Under a memorandum of understanding between the Secretary of the Army and the Secretary of the Interior dated July 13, 1967, the Department of the Interior reviews and comments on all applications for dredging permits. Where the Secretary of the Interior advises that such activities will result in deleterious effects on water quality, the permittee is required to explore every possibility in finding alternate disposal sites and methods.

Where alternate solutions are not immediately available, the Corps may allow such dredging projects as are economically essential to continue on an interim basis pending development of such solutions.

MR. FRANGOS: Thank you.

MR. STEIN: Are we set?

MR. FRANGOS: Yes, that is fine. Thank you.

MR. PURDY: Mr. Chairman.

MR. STEIN: Yes, Mr. Purdy.

MR. PURDY: I would like to question the General on the review procedure that is used to determine whether dredgings are polluted. Who makes this decision?

GEN. TARBOX: The FWPCA does, Mr. Purdy.

MR. PURDY: Is there any opportunity for the States to participate in this review procedure?

GEN. TARBOX: Perhaps Mr. Poston or somebody from his office can answer that.

MR. POSTON: Yes, there is.

MR. PURDY: We had a couple last year that I know that there was a difference of opinion on as to whether or not the dredgings were polluted, and I think at a later point in time that this was reviewed and revised. I don't remember where we had an opportunity to review the dredgings on whether certain harbor dredgings were polluted last year.

MR. POSTON: Well, I think we would be very anxious for you to do this.

MR. PURDY: We would like to participate in it.

MR. POSTON: O. K., sir. I think that is about all I can say at this time, unless there is a specific--

MR. STEIN: Yes. As a matter of procedure, as I understand it, the States are supposed to participate with us. This is the first I heard of this--that the States have not participated in the review with us; this is a slip-up. The point is that both the States and the Federal Government should try to see that this doesn't happen again.

To be perfectly cardid, in dealing with a big organization like ours, unless you watch out for this, it very well may happen in individual cases. When a case comes up, the States are going to have to kind of look after their own case. It is like being a patient, you have got to follow up on your own case. I am sure what we want to do is very clear. If there is any problem you should get in touch with Mr. Poston or myself, and I am quite sure this will be taken care of. What happens is inadvertence, I guess, and not that someone wants to keep you out.

MR. PURDY: I think certain decisions had to be reached rather rapidly, and I am attempting to take care of our own case at this point.

MR. STEIN: Yes, right. Thank you. This happens to us all the time, and I guess in the Corps or anywhere else, with the best of intentions they make a rapid decision and every one of us doesn't get consulted at times.

GEN. TARBOX: May I add to that, Chairman Stein, that as you said, that decisions were necessary so that we could find out whether it was permissible to dredge in a certain harbor, so we did ask for immediate results. And then in some cases where we thought that maybe the whole harbor or the outer channel was not polluted, even though they did find pollution in parts of the harbor, we brought that to your attention and it was investigated further and we did obtain relief that way. So I think it was a pretty fair administration of the program.

MR. PURDY: Satisfied.

MR. STEIN: All right. Thank you.

Are there any further questions? If not, thank you very much for your contribution, General. I hope you have a good meeting in St. Paul.

GEN. TARBOX: Thank you, Chairman Stein.

MR. STEIN: Because of the commitment of Gen. Tarbox of the Corps of Engineers, we placed this dredging program first. Now we will proceed with what we ordinarily would have considered our first statements on this, the statements of the States concerning the compliance with the remedial schedules. Perhaps we could start at the end of the table there.

Mr. Purdy, do you want to start off with the statement of Michigan?

MR. PURDY: Yes, sir.

The statement for Michigan will be presented by Mr. Frost, the chief engineer.

MR. STEIN: Yes, Mr. Frost.

STATEMENT BY FRANCIS B. FROST
CHIEF ENGINEER, WATER RESOURCES COMMISSION
MICHIGAN DEPARTMENT OF NATURAL RESOURCES
LANSING, MICHIGAN

MR. FROST: Mr. Chairman and gentlemen. It is a pleasure for me to present to you the Michigan report on its program for pollution control in the Lake Michigan basin. If you care to follow me, sirs, in the report, I will start on page 3.

Purpose

At the first session in Chicago, beginning January 31, 1968, a joint report was submitted on behalf of the Michigan Water Resources Commission and the Michigan Department of Public Health which outlined various State programs to abate pollution and enhance the quality of the waters of Lake Michigan and its tributaries. This report will review, up-date and amplify certain information earlier presented which specifically relates to the State-oriented recommendations of the Secretary of the Department of the Interior stemming from the first session.

And Mr. Chairman, I do not propose to read the entire report, but I would ask that it be inserted in the record.

MR. STEIN: The report will be entered as if read, without objection.

MR. FROST: As to Recommendations 1, 2 and 3 on treatment needs, we submit the following:

On February 5, 1968, letters were sent to all municipalities of 2,000 population or larger which have wastewater treatment plants discharging to the surface waters of the State. The letter transmitted a copy of the Resolution adopted by the Water Resources Commission in October 1967 calling for removal of phosphorus compounds from waste discharges by June 1, 1977. It also pointed out that June 1, 1977, was an outside date for meeting the objective and that earlier compliance should be sought wherever possible.

On June 3, 1968, letters were sent to-- and here I insert the word "70"--on June 3, 1968, letters were sent to 70 communities within the Lake Michigan Basin advancing the date for phosphorus removal to December 1972 in conformance with the Secretary's recommendation.

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Those communities within the basin, and discharging to interstate waters, were also apprised of the need to provide secondary treatment by June 1, 1972, unless it can be demonstrated that a lesser degree of treatment or control will provide for water quality enhancement commensurate with present and proposed future uses as defined by the Federal-State interstate water quality standards.

The copies of the letters and the listing of the communities affected are shown in Appendix A, B and C.

During the past two months, formal Stipulations have been sent to communities which have responded favorably to the requests for improved treatment. The Stipulations, when executed by the municipal government and the Commission, will formalize an orderly study, design and construction program with performance dates consistent with the Secretary's recommendation. Appendix D and E show the forms of these Stipulations. Communities not indicating a desire to proceed voluntarily have been scheduled for appearance before the Commission as the first step in enforcement proceedings.

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In this regard, sir, some 35 communities in the Lake Michigan Basin have indicated their intention to proceed voluntarily and some 15 communities have already executed and returned to the Commission this Stipulation.

Appendix F and G have been prepared in further response to recommendations 1, 2 and 3. These list all municipal and industrial waste effluent dischargers within the Lake Michigan Basin and summarize information on the type of discharge, effect on Lake Michigan waters, improvement needs and the program for remedial action where such is needed. The lists were submitted to the Chairman by letter dated October 31, 1968.

In addition, sirs, in your report you will find some loose leaf sheets, and this furtner updates this program.

On Recommendation No. 4, regarding disinfection, in January 1967 a policy was adopted by the Michigan Department of Public Health requiring year-round disinfection of waste effluent from all municipal treatment plants prior to discharge to the surface waters of the State. This program is in full force and effect at all such communities within the Lake Michigan Basin. In addition, growing numbers of communities are instituting bacteriological testing programs as a check on chlorine residuals.

In regard to Recommendations 5 and 6 on collection needs, Act 228, Public Acts of 1967, is an act to regulate the subdivision of land and to promote the public health by providing authority to the Michigan Department of Public Health to approve subdivision developments not served by public sewers, contingent on the suitability of soils. This new program has already had a beneficial effect in accelerating municipal collection and disposal systems in nearby developing areas and preventing use of septic tank-tile field systems in unsuitable areas.

Act 329, Public Acts of 1966, as amended, establishes authority to provide State grants for sewage treatment facilities in conjunction with Federal grants under United States Public Law 84-660, as amended. Pertinent provisions of Act 329 are also listed herein.

With regard to Recommendations 6 and 7

on overflows, in its supervisory capacity over municipal waste collection and treatment systems, the Michigan Department of Public Health continues to promote the most effective utilization of these systems. Adjustable regulating devices at points of combined overflow are one of a number of techniques utilized to make use of system storage capacities and minimize combined overflows.

In Michigan's water quality standards program and plan of implementation, the Commission has developed a policy wherein all new sewerage systems are to be developed on the basis of separate sewers for storm-water and sanitary wastewaters. Whenever feasible, separated sanitary wastewater systems are not to be discharged into existing combined systems. If such a discharge does occur, control facilities must be developed on the combined system to provide for enhancement of the receiving water quality commensurate with present and proposed future water uses and to be consistent with the requirements of State law. In those areas where noncompliance with the standards is determined to exist as the result of overflows of sanitary wastewater in storm runoff, the Commission is requiring the best practicable treatment or control no later than June 1, 1977. The Commission is presently directing its attention to certain major metropolitan areas where problems of this type are known to exist.

Regarding Recommendation No. 8 on the discharge of treatable industrial wastes to municipal sewer systems, Michigan has had a long standing program that encourages the discharge of industrial wastes to municipal collection and treatment systems where such wastes are compatible or can be made compatible by pretreatment. The Kalamazoo area is a good example of a recent program of this type where paper mills within and around the city discharge primary waste effluent to the city's activated sludge treatment plant. This particular program has had a dramatic effect in upgrading the quality of the Kalamazoo River.

With regard to Recommendation No. 9, continuous disinfection for industrial waste effluents containing pathogenic organisms. It is recognized that industries such as slaughterhouses, certain pulp and paper mills and some food processing plants may have wastes of public health significance as illustrated by bacteriological testing procedures. Where such a public health hazard can be anticipated or be shown to exist, disinfection of the waste is required prior to discharge.

Recommendation No. 11, the prohibition of the dumping of polluted material into Lake Michigan. As reported to the Chairman by letter dated October 31, 1968, Act 247, Public Acts of 1955, as amended, authorized the former Department of Conservation to regulate the deposition of materials on State bottom lands. All requests for deposition of materials on such bottom lands are evaluated to determine, prior to the issuance of a permit, whether the material to be deposited contains substances which will cause pollution.

Recommendation 13, uniform rules and regulations for controlling wastes from watercraft. As previously reported, the Michigan Water Resources Commission in January 1968 adopted a rule to control pollution from marine toilets on watercraft. The rule does not allow the macerator chlorinator and does authorize the use of holding tanks or incinerators. The rule becomes effective January 1, 1970 and public acceptance of this program has generally been encouraging.

Private marina operators are beginning to install pump-out stations and treatment facilities where needed and the Michigan Waterways Commission has accelerated its program to provide similar facilities at State harbors of refuge on the Great Lakes. It is expected that at least six harbors of refuge will have facilities in operation by the 1969 boating season.

Regarding Recommendation 15 on pesticides, despite the authority that now exists in the State of Michigan, Act 233, Public Acts of 1959, as last amended by Act 91, Public Acts of 1968, provides for the licensing of persons engaged in the business of applying pesticides and economic poisons out of doors, with the licensing program being administered by the Director of the Michigan Department of Agriculture. The act further establishes an Advisory Committee to consult with and aid the Director in the administration of the act. The committee is composed of representatives of the Department of Public Health, Department of Natural Resources, the Aeronautics Commission, the Water Resources Commission, and the Pesticide Research Center of Michigan State University. A copy of Act 91 is attached as Appendix H.

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With regard to Recommendation 18, an inventory of all sites where potential exists for major spills of oil and other hazardous material, a list of potential oil spill sites and other hazardous materials was submitted to the Chairman by letter of October 31, 1968, and is attached hereto as Appendix I.

Recommendation 19, regarding the state water pollution control agencies shall arrange for a broad spectrum of water quality analyses at specified water treatment plants. In this regard, water quality analysis programs have been expanded to comply with the Secretary's recommendation at the cities of Benton Harbor and Grand Rapids. Data for 1968 at these two stations is summarized in the attached Appendix J. Daily analytical data is available and can be furnished upon request.

In regard to Michigan's clean water bond program, in November 1968 Michigan electors, by a three to one margin, authorized the sale of $335 million worth of bonds for purposes of assisting communities in improving existing and constructing new waste treatment plants; $50 million of this total bond program is to be used for sewer construction assistance for communities without sewers which are contributing to an existing pollution problem and have low property valuation.

Implementing legislation is expected within the near future which will spell out the details of administrating and funding specific projects.

It is clear that the net effect of the bond program will be to accelerate and assure completion of Michigan's program of pollution control and water quality enhancement.

Thank you, Mr. Chairman.

MR. STEIN: Thank you.

(The following are the documents submitted by Mr. Frost:)

FOR THE RECONVENED CONFERENCE
SECOND SESSION
ON
POLLUTION OF LAKE MICHIGAN AND ITS TRIBUTARY BASINS
(WISCONSIN-ILLINOIS-INDIANA-MICHIGAN)
CALLED BY
MURRAY STEIN, CONFERENCE CHAIRMAN
DEPARTMENT OF THE INTERIOR

F. B. Frost

STARTING FEBRUARY 25, 1969
CHICAGO, ILLINOIS
ON BEHALF OF
THE
MICHIGAN WATER RESOURCES COMMISSION
February 1969

* * *

MICHIGAN WATER RESOURCES COMMISSION

John E. Vogt, Chairman, representing Michigan Department of Public Health, R. C. Rice, M.D., Director.

Stanley Quackenbush, Vice Chairman, representing Department of Agriculture, B. Dale Ball, Director.

Gerald E. Eddy, representing Department of Natural Resources, Ralph A. MacMullan, Director.

John P. Woodford, representing the State Highway Commission.

George F. Liddle, representing Municipal Groups.

Lynn F. Baldwin, representing Organized Conservation Groups.

Jim Gilmore, representing Industrial Management Groups.

Ralph W. Purdy
Executive Secretary

Purpose

At the first session in Chicago, beginning January 31, 1968, a joint report was submitted on behalf of the Michigan Water Resources Commission and the Michigan Department of Public Health which outlined various State programs to abate pollution and enhance the quality of the waters of Lake Michigan and its tributaries. This report will review, up-date and amplify certain information earlier presented which specifically relates to the State-oriented recommendations of the Secretary of the Department of the Interior stemming from the first session.

RECOMMENDATION 1

> Waste treatment is to be provided by all municipalities to achieve at least 80% reduction of total phosphorus and to produce an effluent that will not result in degradation of Lake Michigan's water quality. Such

treatment will provide compliance with the water quality standards for Lake Michigan as approved by the Secretary of the Interior and the appropriate State water pollution control agency of Illinois, Indiana, Michigan or Wisconsin. This action is to be substantially accomplished by December 1972.

RECOMMENDATION 2

Industries not connected to municipal sewer systems are to provide treatment so as not to result in the degradation of Lake Michigan's water quality and to meet the water quality standards for Lake Michigan as approved by the Secretary of the Interior and the appropriate State water pollution control agency of Illinois, Indiana, Michigan or Wisconsin. This action is to be substantially accomplished by December 1972.

RECOMMENDATION 3

Within six months each State water pollution control agency shall list the municipalities and industries discharging wastewater to the Lake Michigan basin. The United States Department of the Interior will provide a comparable list of Federal installations. Each source so listed will indicate whether it discharges pollutants, including nutrients, having a deleterious effect on the Lake Michigan water quality. Detailed action plans for treatment of all waste having deleterious effect on the water quality of Lake Michigan are to be developed. Such plans shall identify the principal characteristics of the waste material now being discharged, the quantities, the proposed program for construction or modification of remedial facilities and a timetable for accomplishment, giving target dates in detail. This list shall be presented to the Conferees for their review and consideration. Pollution sources shall be added to or removed from the list by formal action of the Conferees.

On February 5, 1968, letters were sent to all municipalities of 2,000 population or larger which

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have wastewater treatment plants discharging to the surface waters of the State. The letter transmitted a copy of the Resolution adopted by the Water Resources Commission in October 1967 calling for removal of phosphorus compounds from waste discharges by June 1, 1977. It also pointed out that June 1, 1977, was an outside date for meeting the objective and that earlier compliance should be sought wherever possible.

On June 3, 1968, letters were sent to communities within the Lake Michigan Basin advancing the date for phosphorus removal to December 1972 in conformance with the Secretary's recommendation. Those communities within the basin, and discharging to interstate waters, were also apprised of the need to provide secondary treatment by June 1, 1972, unless it can be demonstrated that a lesser degree of treatment or control will provide for water quality enhancement commensurate with present and proposed future uses as defined by the Federal-State interstate water quality standards. (See Appendix A, B and C.)

During the past two months, formal Stipulations have been sent to communities which have responded favorably to the requests for improved treatment. The Stipulations, when executed by the municipal government and the Commission, will formalize an orderly study, design and construction program with performance dates consistent with the Secretary's recommendation. Appendix D and E show the forms of these Stipulations. Communities not indicating a desire to proceed voluntarily have been scheduled for appearance before the Commission as the first step in enforcement proceedings.

Appendix F and G have been prepared in further response to recommendations 1 2 and 3. These list all municipal and industrial waste effluent dischargers within the Lake Michigan Basin and summarize information on the type of discharge, effect on Lake Michigan waters, improvement needs and the program for remedial action where such is needed. The lists were submitted to the Chairman by letter dated October 31, 1968.

RECOMMENDATION 4

> Continuous disinfection is to be provided throughout the year for all municipal waste treatment plant effluents. This

action is to be accomplished as soon as possible and not later than May 1969.

In January 1967 a policy was adopted by the Michigan Department of Public Health requiring year-round disinfection of waste effluent from all municipal treatment plants prior to discharge to the surface waters of the State. This program is in full force and effect at all such communities within the Lake Michigan Basin. In addition, growing numbers of communities are instituting bacteriological testing programs as a check on chlorine residuals and regimens.

RECOMMENDATION 5

Unified collection systems serving contiguous urban areas are to be encouraged.

RECOMMENDATION 14

Each of the State water pollution control agencies accelerate programs to provide for the maximum use of area-wide sewage facilities to discourage the proliferation of small treatment plants in contiguous urbanized areas and foster the replacement of septic tanks with adequate collection and treatment.

Act 228, Public Acts of 1967, is an act to regulate the subdivision of land and to promote the public health by providing authority to the Michigan Department of Public Health to approve subdivision developments not served by public sewers, contingent on the suitability of soils. This new program has already had a beneficial effect in accelerating municipal collection and disposal systems in nearby developing areas and preventing use of septic tank-tile field systems in unsuitable areas.

Act 329, Public Acts of 1966, as amended, establishes authority to provide State grants for sewage treatment facilities in conjunction with Federal grants under United States Public Law 84-660, as amended. Pertinent provisions of Act 329 dealing with unified waste collection and treatment programs are as follows:

> "Sec. 7. Effective July 1, 1968,a grant shall not be made until the local agency's governing body has adopted and submitted to the water resources commission a comprehensive long-range plan for the control of pollution in the area within its jurisdiction, hereinafter

referred to as the official plan. If more than one local agency has authority to provide service for sewage collection in the same area, the required plan may be submitted jointly by the local agencies concerned or by one local agency with the concurrence of the others.

"Sec. 8. An official plan shall:

(a) Provide for timely construction of sewage treatment facilities which will prevent the discharge of untreated or inadequately treated sewage or other wastes as defined by Act No. 245 of the Public Acts of 1929, as amended, being sections 323.1 to 323.12a of the Compiled Laws of 1948, into the waters of the State.

(b) Provide for adequate planning, zoning, population projections and engineering and economic studies to delineate with all practicable precision those portions of the area which public sewerage systems may reasonably be expected to serve within 10 years, and within 20 years, and any areas in which the provision of such services is not reasonably foreseeable.

(c) Be in compliance with the State pollution control plan required by United States Public Law 84-660, as amended.

(d) Set forth a time schedule and proposed method of financing, construction and operation of the pollution control system.

(e) Be reviewed by the official planning agencies having jurisdiction within the local agency, including the regional planning agency, if any, for consistency with programs of planning for the area, which reviews shall be transmitted to the water resources commission with the plan.

"Sec. 10. (1) The water resources commission may approve the official plan as submitted or, if it finds the plan to be inconsistent with the proper local or regional water pollution control, it may return the plan for appropriate modification. Where more than one local agency is involved in an official plan and the local agencies are unable to agree upon an official plan which the commission will approve, the commission shall develop the necessary official plan.

(2) The commission may provide technical assistance to local agencies in coordinating official plans.

(3) The commission shall cooperate with all appropriate Federal, State, interstate and local agencies and with appropriate private organizations."

RECOMMENDATION 6

Adjustable overflow regulating devices are to be installed on existing combined sewer systems, and be so designed and operated as to utilize to the fullest extent possible the capacity of interceptor sewers for conveying combined flow to treatment facilities. The treatment facilities shall be modified where necessary to minimize bypassing. This action is to be taken as soon as possible and not later than December 1970.

RECOMMENDATION 7

Effective immediately, combined sewers are to be separated in coordination with all urban reconstruction projects, and prohibited in all new developments, except where other techniques can be applied to control such pollution. Pollution from combined sewers is to be controlled by July 1977.

In its supervisory capacity over municipal waste collection and treatment systems, the Michigan Department of Public Health continues to promote the most effective utilization of these systems. Adjustable regulating devices at points of combined overflow are one of a number of techniques utilized to make use of system storage capacities and minimize combined overflows.

In Michigan's water quality standards program and plan of implementation, the Commission has developed a policy wherein all new sewerage systems are to be developed on the basis of separate sewers for storm-water and sanitary wastewaters. Whenever feasible, separated sanitary wastewater systems are not to be discharged into existing combined systems. If such a discharge does occur, control facilities must be developed on the combined system to provide for enhancement of the receiving water quality commensurate with present and proposed future water uses and to be consistent with the requirements of State law. In those areas where noncompliance with the standards is determined to exist as the result of overflows of sanitary wastewater in storm runoff, the Commission is requiring the best practicable treatment or control no later than June 1, 1977. The Commission is presently directing its attention to certain major metropolitan areas where problems of this type are known to exist.

RECOMMENDATION 8

Discharge of treatable industrial

wastes (following needed preliminary treatment) to municipal sewer systems is to be encouraged.

Michigan has had a long standing program that encourages the discharge of industrial wastes to municipal collection and treatment systems where such wastes are compatible or can be made compatible by pretreatment. The Kalamazoo area is a good example of a recent program of this type where paper mills within and around the city discharge primary waste effluent to the city's activated sludge treatment plant. This particular program has had a dramatic effect in upgrading the quality of the Kalamazoo River.

RECOMMENDATION 9

Continuous disinfection is to be provided for industrial effluents containing pathogenic organisms, or organisms which indicate the presence of such pathogens, which may have a deleterious effect on persons coming into contact with Lake Michigan waters.

It is recognized that industries such as slaughterhouses, certain pulp and paper mills and some food processing plants may have wastes of public health significance as illustrated by bacteriological testing procedures. Where such a public health hazard can be anticipated or be shown to exist, disinfection of the waste is required prior to discharge.

RECOMMENDATION 11

> The prohibition of the dumping of polluted material into Lake Michigan is to be accomplished as soon as possible. The Corps of Engineers and the States are requested to report to the Conferees within six months concerning their program, at which time the Conferees will consider adopting a coordinated approach toward the disposal of dredged material together with a target date for getting the program into operation.

As reported to the Chairman by letter dated October 31, 1968, Act 247, Public Acts of 1955, as amended, authorized the former Department of Conservation to regulate the deposition of materials on State bottom lands. All requests for deposition of materials on such bottom lands are evaluated to determine, prior to the issuance of a permit, whether the material to be deposited contains substances which will cause pollution.

RECOMMENDATION 13

The representatives of the Conferees within 60 days meet and agree upon uniform rules and regulations for controlling wastes from watercraft. These rules and regulations will generally conform with the harbor pollution code adopted by the city of Chicago and the regulations adopted by the Michigan Water Resources Commission. The use of maceration chlorination is not approved at the present time. Since each of the four States operates under different statutes, Conferees will recommend to their respective boards, legislatures, etc., approval of the proposed uniform rules and regulations. Commensurate requirements controlling the discharge of wastes from commercial vessels is to be the responsibility of the Federal Government.

As previously reported, the Michigan Water

Resources Commission in January 1968 adopted a rule to control pollution from marine toilets on watercraft. The rule does not allow the macerator chlorinator and does authorize the use of holding tanks or incinerators. The rule becomes effective January 1, 1970, and public acceptance of this program has generally been encouraging. Private marina operators are beginning to install pump-out stations and treatment facilities where needed and the Michigan Waterways Commission has accelerated its program to provide similar facilities at State harbors of refuge on the Great Lakes. It is expected that at least six harbors of refuge will have facilities in operation by the 1969 boating season.

RECOMMENDATION 15

> Technical committee on pesticides will be established to be chaired by a member of the Federal Water Pollution Control Administration with representatives from each State. The committee shall evaluate the pesticide problem and recommend to the Conferees a program of monitoring and control. The first report will be submitted in six

months to the Conferees. The States shall seek legislation to license commercial applicators.

Act 233, Public Acts of 1959, as last amended by Act 91, Public Acts of 1968, provides for the licensing of persons engaged in the business of applying pesticides and economic poisons out of doors, with the licensing program being administered by the Director of the Michigan Department of Agriculture. The act further establishes an Advisory Committee to consult with and aid the Director in the administration of the act. The committee is composed of representatives of the Department of Public Health, Department of Natural Resources, the Aeronautics Commission, the Water Resources Commission, the Pesticide Research Center of Michigan State University. A copy of Act 91 is attached as Appendix H.

RECOMMENDATION 18

State water pollution control agencies and U. S. Department of the Interior shall compile an inventory of all sites where potential exists for major spills of oil and other hazardous material, which may affect the water quality of

Lake Michigan, and require that measures be taken where necessary to prevent the escape of this material to the waters. A report will be submitted to the Conferees within six months.

A list of potential oil spill sites and other hazardous materials was submitted to the Chairman by letter of October 31, 1968, and is attached hereto as Appendix I.

RECOMMENDATION 19

The State water pollution control agencies shall arrange for a broad spectrum of water quality analyses, including planktonic algae counts, to be performed at least twice weekly at the following water filtration plants: Green Bay, Milwaukee, Evanston, Chicago (both plants), Gary, Michigan City, Benton Harbor, and Grand Rapids. Results will be reported annually to the Conferees.

Water quality analysis programs have been expanded to comply with the Secretary's recommendation at the cities of Benton Harbor and Grand Rapids. Data for

1968 at these two stations is summarized in the attached Appendix J. Daily analytical data is available and can be furnished upon request.

Michigan's Clean Water Bond Program

In November 1968 Michigan electors, by a three to one margin, authorized the sale of $335 million worth of bonds for purposes of assisting communities in improving existing and constructing new waste treatment plants; $50 million of this total bond program is to be used for sewer construction assistance for communities without sewers which are contributing to an existing pollution problem and have low property valuation.

Implementing legislation is expected within the near future which will spell out the details of administrating and funding specific projects.

It is clear that the net effect of the bond program will be to accelerate and assure completion of Michigan's program of pollution control and water quality enhancement.

APPENDIX A

STATE OF MICHIGAN

GEORGE ROMNEY, Governor

DEPARTMENT OF CONSERVATION

RALPH A. MAC MULLAN, Director

CONSERVATION COMMISSION

HARRY H. WHITELEY, Chairman
CARL T. JOHNSON

E. M. LAITALA

ROBERT C. McLAUGHLIN

AUGUST SCHOLLE

WATER RESOURCES COMMISSION

GEORGE F. LIDDLE, Chairman

JOHN E. VOGT, Vice Chairman

B. DALE BALL

GERALD E. EDDY

JAMES V. MURRAY

LYNN F. BALDWIN

JIM GILMORE

----

200 MILL ST., LANSING 48926
Tel. 373-3560

June 3, 1968

Gentlemen:

Under the authority of Act 245, of the

Michigan Public Acts of 1929, as amended, and consistent with the provisions of the Federal Water Quality Act of 1965 (P.L. 89-234), the Water Resources Commission has adopted water quality standards for interstate waters.

As a part of the Plan of Implementation included in the water quality standards, the Commission has stated as follows:

> "In those areas where noncompliance with the standards is determined to exist either by direct discharge or by discharge to tributaries which in turn flow into interstate waters, a program will be established which will require, no later than June 1, 1972, treatment facilities adequate for meeting established water quality standards. Secondary treatment will be required as a minimum at all municipal wastewater treatment plants to meet the adopted water quality standards unless it can be demonstrated that a lesser degree of treatment or control will provide for water quality enhancement commensurate with present and proposed future uses."

The (________________) is not now providing secondary treatment and therefore has an obligation to do so by the prescribed date, June 1, 1972, or to demonstrate to the Commission that a lesser degree of treatment will attain the water quality necessary to protect the identified present or prospective uses of the waters into which your wastewater effluent is discharged. The present and prospective uses of such waters, and the water quality requirements for their protection, are shown in the accompanying documents.

Concurrently with the installation of secondary treatment, you should provide for the removal of phosphorous compounds from your municipal waste effluent, the need for which was made known to you in my letter of February 5, 1968. While the outside date for such removal set forth in that letter was June 1, 1977, meeting this requirement in conjunction with the development of secondary treatment facilities will, of course, be highly desirable from the standpoint of cost to you.

Furthermore, the date for substantial accomplishment of phosphate removal from wastewater discharges in the Lake Michigan Tributary Basin was advanced to December 1972 in the Conclusions of the Federal-State Conference on the Pollution of Lake Michigan and its Tributary Basin that was held in Chicago earlier this year. The Conference established the degree of removal to be attained at not less than 80 percent.

It is the Commission's policy to encourage voluntary compliance with pollution control requirements and if it is the desire of (   ) to proceed on that basis, a letter transmitting formal verification of such intent, by resolution of your governing body, should be filed with the Commission within the next 60 days. Upon receipt of such verification, we will proceed to develop an appropriate form of stipulation between the (   ) and the Water Resources Commission incorporating the necessary terms of treatment accomplishment and performance schedule.

If such verification is not received, it may be expected that the Commission will initiate statutory procedures leading to the issuance of a Final Order of Determination covering this requirement.

We shall await your decision in this matter.

Very truly yours,
WATER RESOURCES COMMISSION

Loring F. Oeming
Executive Secretary

NB/bs
Encl.

Gladstone - Lake Michigan
Petoskey - Lake Michigan
Harbor Springs - Lake Michigan
Berrien Springs - St. Joseph River
Buchanan - St. Joseph River
Niles - St. Joseph River
Three Rivers - St. Joseph River
Iron Mountain - Menominee
Kingsford - Menominee
Menominee - Menominee River
Wequetonsing - Lake Michigan (Assn.?)
Harbor Point Assn. - Lake Michigan

F. B. Frost

APPENDIX B

STATE OF MICHIGAN

GEORGE ROMNEY, Governor

DEPARTMENT OF CONSERVATION

RALPH A. MAC MULLAN, Director

CONSERVATION COMMISSION

HARRY H. WHITELEY,
Chairman

CARL T. JOHNSON

E. M. LAITALA

ROBERT C. McLAUGHLIN

AUGUST SCHOLLE

WATER RESOURCES COMMISSIO

GEORGE F. LIDDLE,
Chairman

JOHN E. VOGT,
Vice Chairman

B. DALE BALL

GERALD E. EDDY

JAMES V. MURRAY

LYNN F. BALDWIN

JIM GILMORE

----

200 MILL ST., LANSING 48926
Tel. 373-3560

June 3, 1968

Gentlemen:

On February 5, I transmitted to you a copy of the Resolution adopted by the Water Resources

Commission in October 1967 which calls for removal of phosphorous compounds from waste discharges to waters of the State by June 1, 1977.

It was pointed out in that letter that June 1, 1977, was an outside date for meeting this objective and that earlier compliance would be sought wherever possible.

On February 29-March 5, this year, a Federal-State Conference on the pollution of Lake Michigan and its tributary basin was held in Chicago. The Conclusions of that Conference, which this Commission has committed itself to implement, call for the substantial accomplishment of phosphorous removal by December 1972. The removal sought was established by the Conference at not less than 80 percent of the total phosphorous.

The Commission will accordingly expect the (   ) to embark on a program whereby facilities for the removal of phosphorous compounds from its wastewater prior to discharge to waters of the State will be in operation by December 1972. It is the Commission's policy to encourage voluntary compliance with pollution control requirements and if it is the desire of the (   ) to proceed on that basis, a letter transmitting formal verification of such intent, by resolution of your governing body, should be filed with the Commission within the next 60 days. Upon receipt of such verification, we will proceed to develop an appropriate form of stipulation between the (   ) and the Water Resources Commission incorporating the necessary terms of treatment accomplishment and performance schedule.

If such verification is not received, it may be expected that the Commission will initiate statutory procedures leading to the issuance of a Final Order of Determination covering this requirement.

You should also now be evaluating your present waste treatment in the light of the water quality standards and the water use designations which the Water Resources Commission has adopted for interstate waters. Copies of the standards and the use designations applying to the waters receiving your waste effluent are attached. The Commission has committed itself to attainment of the requisite water quality in interstate waters by June 1, 1972.

We shall await your reply relative to the phosphorous removal aspect of your waste treatment within the above specified 60-day period.

Very truly yours,

WATER RESOURCES COMMISSION

Loring F. Oeming
Executive Secretary

NB:bs

Encl.

To: Benton Harbor & St. Joseph

Bronson

Coldwater

Hillsdale

Sturgis

Vicksburg

APPENDIX C

STATE OF MICHIGAN

GEORGE ROMNEY, Governor

DEPARTMENT OF CONSERVATION

F. B. Frost

RALPH A. MAC MULLAN, Director

CONSERVATION COMMISSION

HARRY H. WHITELEY,
Chairman

CARL T. JOHNSON

E. M. LAITALA

ROBERT C. McLAUGHLIN

AUGUST SCHOLLE

WATER RESOURCES COMMISSION

GEORGE F. LIDDLE,
Chairman

JOHN E. VOGT,
Vice Chairman

B. DALE BALL

GERALD E. EDDY

JAMES V. MURRAY

LYNN F. BALDWIN

JIM GILMORE

----

200 MILL ST., LANSING 48926
Tel. 373-3560

June 3, 1968

Gentlemen:

On February 5, I transmitted to you a copy of the Resolution adopted by the Water Resources Commission in October 1967 which calls for removal of phosphorous compounds from waste discharges to waters of the State by June 1, 1977.

It was pointed out in that letter that June 1, 1977, was an outside date for meeting this objective and that earlier compliance would be sought wherever possible.

On February 29-March 5, this year, a Federal-State Conference on the pollution of Lake Michigan and its tributary basin was held in Chicago. The Conclusions of that Conference, which this Commission has committed itself to implement, call for the substantial accomplishment of phosphorous removal by December 1972. The removal sought was established by the Conference at not less than 80 percent of the total phosphorous.

The Commission will accordingly expect the ( ) to embark on a program whereby facilities for the removal of phosphorous compounds from its wastewater prior to discharge to waters of the State will be in operation by December 1972. It is the Commission's policy to encourage voluntary compliance with pollution control requirements and if it is the desire of the ( ) to proceed on that basis, a letter transmitting formal verification of such intent, by resolution of your governing body, should be filed with the Commission within the next 60 days. Upon receipt of such verification, we will proceed to develop an appropriate form of stipulation between the (   ) and the Water Resources Commission incorporating the necessary terms of treatment accomplishment and performance schedule.

If such verification is not received, it may be expected that the Commission will initiate statutory procedures leading to the issuance of a Final Order of Determination covering this requirement.

Although the Commission has not adopted water use designations for intrastate waters (which general category includes the waters that receive your municipal waste effluent) it has adopted water quality standards for these waters as shown on the attached material and it will adopt use designations within the next several months. You should accordingly now be evaluating your present waste treatment in the light of prospective use designation for the receiving waters, and be prepared to undertake the necessary improvements promptly upon the Commission's formal adoption of use designation for those waters.

We shall await your reply within the

above specified 30-day period.

Very truly yours,

WATER RESOURCES COMMISSION

Loring F. Oeming

Executive Secretary

NB:bs

Encl.

TO:
Iron River
Norway
Escanaba
Manistique
Boyne City
Charlevoix
East Jordan
Manistee
Ludington
Big Rapids
Cadillac
Fremont
Muskegon
Muskegon Heights
North Muskegon
Reed City
Grand Havey
Spring Lake
Wyoming
Grand Rapids
Grandville
Sparta
Rockford
Greenville
Ionia
Hastings
Portland
St. Johns

F. B. Frost

Lansing

East Lansing

Williamston

Eaton Rapids

Mason

Delta Twp., Eaton County
(Dorothy Staley, Clerk)

Delhi Twp., Ingham County
(Enid M. Lewis, Clerk)

Grand Ledge

Lowell

Holland

Zeeland

Allegan

Otsego

Kalamazoo

Plainwell

Battle Creek

Marshall

Albion

Charlotte

South Haven

Bangor

Paw Paw

Dowagiac

New Buffalo

APPENDIX D

STATE OF MICHIGAN

STIPULATION BETWEEN THE WATER RESOURCES COMMISSION

an agency of the State of Michigan

and the

____

a Municipal Corporation

F. B. Frost

To restrict the polluting content of sewage and wastes discharged to the waters of the State by the __________, Michigan

WHEREAS, the Water Resources Commission of the State of Michigan, hereinafter referred to as the Commission, is by law charged with the responsibility of protecting and conserving the water resources of the State of Michigan, including the Great Lakes, which are or may be affected by waste disposal of municipalities, industries, public or private corporations, individuals, partnership associations, or any other entity; and

WHEREAS, the Commission is authorized by statute to control and prohibit the pollution of said waters and to bring any appropriate action deemed necessary to enforce any and all laws relating to the pollution of the waters of this State; and

WHEREAS, the Commission has determined that nutrients released to the water environment are a contributing factor to an accelerated rate of

F. B. Frost

aging of lakes and streams, as evidenced by aquatic weeds and algae and that phosphorous is an essential element to such growths; and

WHEREAS, the Commission has concurred in the conclusions and recommendations of the Federal-State Conference on Pollution of Lake Michigan which establishes that eighty percent (80%) phosphorous removal from contributing wastewater discharges shall be accomplished by December 1972; and

WHEREAS, the ___________, a municipal corporation hereinafter referred to as the ______________, presently discharges wastewater effluent to the waters of Lake Michigan or its tributaries without adequate removal of phosphorous compounds; and

WHEREAS, the ___________ acknowledges that it is discharging inadequately treated wastes to the waters of the State, contrary to the provisions of Act 245, Public Acts of 1929, as amended; and

WHEREAS, the ___________ in consideration for the

Commission's holding in abeyance the initiating of statutory procedures for pollution abatement as prescribed in Section 7, Act 245, Public Acts of 1929, as amended, desires to pursue a voluntary program to restrict and control the polluting content of the aforesaid wastes discharged into the waters of the State.

NOW THEREFORE IT IS HEREBY AGREED, between the respective parties hereto, that:

1. The _______________ shall provide facilities capable of removing a minimum of eighty percent (80%) of the total phosphorus contained in the untreated sewage and wastes, collected by the __________'s system of sewers and drains in accordance with the following time schedule:

   a. Submit preliminary engineering study and basis of design for said facilities to the Director of the Michigan Department of Public Health and obtain his approval thereof on or before June 1, 1969.

b. Submit construction plans and specifications for said facilities to the Director of the Michigan Department of Public Health and obtain his approval thereof on or before September 1, 1970.

c. Award construction contracts and commence construction of said facilities in accordance with plans and specifications approved by the Director of the Michigan Department of Public Health on or before June 1, 1971.

d. Complete construction of said facilities and place same in continuous operation on or before December 1, 1972.

IT IS FURTHER AGREED between the parties hereto that in the event the ______________ fails to meet the time set forth in any of the provisions of this Agreement, the ____________ waives Notice of Determination and Hearing as provided by Section 7 of Act 245, Public Acts of 1929, as amended, and it is agreed that the

Commission may, following Notice to the __________ of its default of this Agreement, enter a Final Order of Determination incorporating the provisions of this Agreement and requiring compliance with the restrictions and terms of this Agreement. PROVIDED FURTHER, however, that the ___________ may within ten (10) days after receipt of Notice of Default, petition the Commission for a hearing to show cause why a Final Order of Determination should not be adopted by the Commission. Following said hearing the Commission may adopt a Final Order of Determination as aforesaid or may in its discretion grant a delay, extension, modification of or release from any or all provisions contained in this Stipulation.

IT IS FURTHER AGREED between the parties hereto that this Stipulation shall remain in effect until further determination of the Commission as provided by law.

_______________, a municipal corporation

By: ____

By: ____

Dated: ________________________________

F. B. Frost

WATER RESOURCES COMMISSION of the State
of Michigan

By: ______________________________
(Chairman)

By: ______________________________
(Executive Secretary)

Dated: ______________________________

APPENDIX E

STATE OF MICHIGAN

STIPULATION BETWEEN THE WATER RESOURCES COMMISSION
an agency of the State of Michigan
and the
____
a Municipal Corporation

To restrict the polluting content of sewage and wastes discharged to the waters of the State by the ________________, Michigan.

WHEREAS, the Water Resources Commission of the State of Michigan, hereinafter referred to as the Commission, is by law charged with the responsibility of protecting and conserving the water resources of the State of Michigan, including the Great Lakes, which are or may be affected by waste disposal of municipalities, industries, public or private corporations, individuals, partnership associations, or any other entity; and

WHEREAS, the Commission has adopted water quality standards for interstate waters and the plan of implementation therefor sets forth that secondary treatment will be required as a minimum at all municipal wastewater treatment plants to meet the adopted water quality standards unless it can be demonstrated that a lesser degree of treatment or control will provide for water quality enhancement commensurate with present and proposed future uses; and

WHEREAS, the Commission has determined that nutrients released to the water environment are a contributing factor to an accelerated rate of aging of lakes and streams as evidenced by aquatic weeds and algae and that phosphorus is an essential element to such growths; and

WHEREAS, the Commission has concurred in the conclusions and recommendations of the Federal-State Conference on Pollution of Lake Michigan which establishes that eighty percent (80%) phosphorus removal from contributing wastewater discharges shall be accomplished by December 1, 1972; and

WHEREAS, the ______________, a municipal corporation hereinafter referred to as the ______________, presently discharges wastewater effluent to interstate waters without secondary treatment and without adequate removal of phosphorus compounds; and

WHEREAS, the ______________ acknowledges that it is discharging inadequately treated waste with respect to removal of phosphorus compounds to waters of the State, contrary to the provisions of Act 245, Public Acts of 1929, as amended; and

WHEREAS, the ______________ acknowledges the need for meeting established water quality standards with respect to secondary treatment and in consideration of the Commission's holding in abeyance the initiation of statutory procedures for pollution abatement as prescribed in Section 7, Act 245, Public Acts of 1929, as amended, desires to pursue a voluntary program to restrict and control the polluting content of the aforesaid wastes discharged to the waters of the State.

NOW THEREFORE IT IS HEREBY AGREED, between the respective parties hereto, that:

I. The ______________ shall provide secondary treatment or a lesser degree of treatment if it can be shown by the ____________ to the satisfaction of the Michigan Water Resources Commission that such lesser degree of treatment will provide for water quality enhancement commensurate with present and proposed future water uses and in addition shall provide facilities capable of removing a minimum of eighty percent (80%) of the total phosphorus contained in the untreated sewage and wastes collected by the ________'s system of sewers and drains in accordance with the following time schedule:

F. B. Frost

A. Submit an engineering study and basis of design for secondary biological treatment facilities or such a lesser degree of treatment as will provide for water quality enhancement commensurate with present and proposed water uses and in addition for phosphorus removal facilities to the Director of the Michigan Department of Public Health and the Michigan Water Resources Commission and obtain their approval thereof on or before June 1, 1969.

B. In the event that the approved basis of design provides for secondary biological treatment, including phosphorus removal:

(1) Submit construction plans and specifications for said facilities to the Director of the Michigan Department of Public Health and obtain his approval

thereof on or before December 1, 1970.

(2) Award construction contracts and commence construction of said facilities in accordance with plans and specifications approved by the Director of the Michigan Department of Public Health on or before April 1, 1971.

(3) Complete construction of said facilities and place same in continuous operation on or before June 1, 1972.

C. In the event that the approved basis of design provides for a degree of treatment less than secondary biological treatment, but includes phosphorus removal:

(1) Submit construction plans and specifications for said facilities to the Director of the

Michigan Department of Public Health and obtain his approval thereof on or before December 1, 1970.

(2) Award construction contracts and commence construction of said facilities in accordance with plans and specifications approved by the Director of the Michigan Department of Public Health on or before June 1, 1971.

(3) Complete construction of said facilities and place same in continuous operation on or before December 1, 1972.

IT IS FURTHER AGREED between the parties hereto that in the event the ____________ fails to obtain approval by June 1, 1969, of the engineering study and basis of design required by Section IA of this Agreement from the Michigan Department of Public Health and the Michigan Water Resources Commission this Stipulation is null and void and the Commission may pursue such procedures as are provided by law to secure compliance with the aforesaid water quality standards and plan of implementation.

IT IS FURTHER AGREED between the parties hereto that in the event the _________ fails to meet the time set forth in any of the provisions of Sections IB and IC of this Agreement, the _________ waives Notice of Determination and Hearing as provided by Section 7 of Act 245, Public Acts of 1929, as amended, and it is agreed that the Commission may, following Notice to the __________ of its default of this Agreement, enter a Final Order of Determination incorporating the provisions of this Agreement and requiring compliance with the restrictions and terms of this Agreement. PROVIDED FURTHER, however, that the ___________ may, within ten (10) days after receipt of Notice of Default, petition the Commission for a hearing to show cause why a Final Order of Determination should not be adopted by the Commission. Following said hearing the Commission may adopt a Final Ordef of Determination as aforesaid or may in its discretion grant a delay, extension, modification of or release from any or all provisions contained in this Stipulation.

IT IS FURTHER AGREED between the parties hereto that this Stipulation shall remain in effect until further determination of the Commission as provided by law.

_______________, a municipal corporation

By: ____

By: ____

Dated: ________________________________

WATER RESOURCES COMMISSION of the state of Michigan

By: ____
(Chairman)

By: ____
(Executive Secretary)

Dated: ________________________________

APPENDIX F

MICHIGAN'S
MUNICIPAL WASTEWATER
DISCHARGE INVENTORY
LAKE MICHIGAN BASIN

				Discharge Characteristics			Affect Lake Michigan Water Quality	IMPROVEMENT NEEDS		PROGRAM FOR REMEDIAL FACILITIES Staff objectives subject to Commission review		
Community	Receiving Waters	Treatment Provided	Population (1964 est.)	5-day BOD Effluent mg/l	Suspended Solids Effluent mg/l	Status and Abatement Action		Nutrient Reduction	New or Improved Treatment	Plans Approved	Start Construction	Complete
1. MENOMINEE (MICH.)												
Alpha	Armstrong Creek	Primary ST	300				no					
Caspian	Iron River	Primary IT	1,490				no					
Crystal Falls	Paint River	None	2,200			Health Department agreement	no		X	11-1-67	5-1-68 under construction	5-1-69
Gaastra	Iron River	Primary ST	600				no					
Iron Mountain-Kingsford	Menominee River	Primary	14,400	192	89	Show cause conference before Commission to be scheduled by January 1, 1969.	yes	X	X	9-1-70	6-1-71	12-1-72
Iron River	Iron River	Primary	3,300	97	76	Statutory proceedings to be initiated by January 1, 1969.	yes	X		9-1-70	6-1-71	12-1-72
Menominee	Menominee River	Primary	11,400	61	50	Stipulation to be developed by January 1, 1969.	yes	X	X	9-1-70	6-1-71	12-1-72
Mineral Hills	Iron River	Primary ST	300				no					
Norway	Menominee River	None	3,200			Statutory proceedings to be initiated by January 1, 1969.	yes	X		3-1-71	12-1-71	12-1-72
South Republic	Michigamme River	Primary ST	400				no					
Stambaugh	Iron River	Secondary AS	1,900	41	38		no					
Stephenson	Little Cedar River	Secondary TF	820	37	35		no					
Vulcan	Menominee River	Primary ST	450				no					
2. BIG CEDAR												
Pinecrest Medicare Facility	Big Cedar River	Secondary TF				Treatment considered adequate.	no					
3. FORD												
No Large Population Centers in Basin												
4. ESCANABA												
Palmer	Warner Creek	Primary ST	850				no					
5. DAYS												
Gladstone	Lake Michigan	Primary	[illegible]	158	110	Conference before Commission to be scheduled by January 1, 1969.	yes	X	X	9-1-70	6-1-71	12-1-72

				Discharge Characteristics				IMPROVEMENT NEEDS		PROGRAM FOR REMEDIAL FACILITIES Staff objectives subject to Commission review		
Community	Receiving Waters	Treatment Provided	Population (1964 est.)	5-day BOD Effluent mg/l	Suspended Solids Effluent mg/l	Status and Abatement Action	Affect Lake Michigan Water Quality	Nutrient Reduction	New or Improved Treatment	Plans Approved	Start Construction	Complete
6. RAPID												
Masonville Township	Rapid River	None	600				no					
7. WHITEFISH												
------------------------ ---------------------No Large Population Centers in Basin---												
8. STURGEON												
Sagola	West Branch Sturgeon	Primary ST	100				no					
9. MANISTIQUE												
Manistique	Manistique River	Primary	4,500	22	17	Statutory proceedings to be initiated by January 1, 1969.	yes	X		3-1-71	12-1-71	12-1-72
10. PINE												
Boyne City	Lake Charlevoix	Primary	2,800	49	39	Statutory proceedings to be initiated by January 1, 1969.	yes	X		3-1-71	12-1-71	12-1-72
Charlevoix	Pine River	Primary	2,800	130	64	Statutory proceedings to be initiated by January 1, 1969.	yes	X		3-1-71	12-1-71	12-1-72
East Jordan	Lake Charlevoix	Primary	1,920	65	65	Stipulation to be developed by January 1, 1969.	yes	X		3-1-71	12-1-71	12-1-72
11. ELK												
Bellaire	Intermediate River	None	700				no					
Elk Rapids	Elk River	Primary	1,015				no					
12. BOARDMAN												
Kalkaska	Boardman River	Secondary L	1,320			Treatment considered adequate.	no					
Traverse City	Boardman River	Primary	18,500	164	66	Final Order of Determination dated August, 1968.	yes	X	X	6-1-70	7-15-70	12-31-71
13. BETSIE												
Beulah	Crystal Lake	Primary IT	440				yes	X	X	9-1-70	6-1-71	12-1-72
Elberta	Betsie River	Primary	550	100	78		no					
Frankfort	Betsie River	Primary	1,690	334	107		no					
14. MANISTEE												
Manistee	Manistee River	Primary	8,300	128	69		yes	X		3-1-71	12-1-71	12-1-72
Manton	Cedar and Manton Creeks	None	1,050				no					

				Discharge Characteristics				IMPROVEMENT NEEDS		PROGRAM FOR REMEDIAL FACILITIES Staff objectives subject to Commission review		
Community	Receiving Waters	Treatment Provided	Population (1964 est.)	5-day BOD Effluent mg/l	Suspended Solids Effluent mg/l	Status and Abatement Action	Affect Lake Michigan Water Quality	Nutrient Reduction	New or Improved Treatment	Plans Approved	Start Construction	Complete
15. BIG SABLE												
						------No Large Population Centers in Basin------						
16. LINCOLN												
						------No Large Population Centers in Basin------						
17. PERE MARQUETTE												
Custer	Black Creek	None	365			raw sewage	no					
Ludington	Pere Marquette River	Primary	9,000	39	63	Stipulation to be developed by January 1, 1969.	yes	x		3-1-71	12-1-71	12-1-72
Scottville	Pere Marquette River	Secondary L	1,245			Treatment considered adequate.	no					
18. PENTWATER												
Hart	Pentwater River	Secondary L	1,990			Treatment considered adequate.	no					
Pentwater	Pentwater River	Secondary L	1,030			Treatment considered adequate.	no					
19. WHITE												
White Cloud	White River	Primary IT	1,000	97	38		no					
Whitehall	White River	Primary	2,800	110	58	Stipulation to be developed by January 1, 1969.	yes	x	x	9-1-70	6-1-71	12-1-72
20. MUSKEGON												
Big Rapids	Muskegon River	Primary	10,100	98	92	Statutory proceedings to be initiated by January 1, 1969.	yes	x		3-1-71	12-1-71	12-1-72
Cadillac	Clam River	Secondary AS	10,300	30	52	Stipulation to be developed by January 1, 1969.	yes	x		3-1-71	12-1-71	12-1-72
Evart	Muskegon River	Primary	1,775	29	48		no					
Fremont	Darling Creek	Secondary TF	3,400	15	27	Stipulation to be developed by January 1, 1969.	yes	x		3-1-71	12-1-71	12-1-72
Howard City	Tamarack Creek	None	1,000				no		x			
Marion	Middle Branch River	None	900			raw sewage	no					

				Discharge Characteristics				IMPROVEMENT NEEDS		PROGRAM FOR REMEDIAL FACILITIES Staff objectives subject to Commission review		
Community	Receiving Waters	Treatment Provided	Population (1 64 est.)	5-day BOD Effluent mg/l	Suspended Solids Effluent mg/l	Status and Abatement Action	Affect Lake Michigan Water Quality	Nutrient Reduction	New or Improved Treatment	Plans Approved	Start Construction	Complete
Muskegon	Muskegon River	Primary	43,000	93	51	Stipulation to be developed by January 1, 1969.	yes	x		3-1-71	12-1-71	12-1-72
Muskegon Heights	Muskegon River	Secondary AS	19,900	23	21	Stipulation to be developed by January 1, 1969.	yes	x		3-1-71	12-1-71	12-1-72
Newaygo	Muskegon River	Primary	1,450	105	62		no					
North Muskegon	Muskegon River	Primary	4,000	163	127	Stipulation to be developed by January 1, 1969.	yes	x		3-1-71	12-1-71	12-1-72
Reed City	Muskegon River	Primary	2,180	272	174	Stipulation to be developed by January 1, 1969	yes	x		3-1-71	12-1-71	12-1-72
21. GRAND												
Ada Township (Ada)	Thornapple River	Secondary L	500			Treatment considered adequate	no					
Alpine Township	York and Mill Creeks	None	5,000			To connect with Grand Rapids system through Kent County Department of Public Works. Construction underway.	yes	x				7-1-69
Ashley	Ashley Drain	None	410			Declared in default of Commission Order and referred to Attorney General in July, 1968.	no				6-1-68	6-1-69
Belding	Flat River	Secondary L	5,000			Treatment considered adequate.	no					
Byron Township, Kent County	Grand River	Secondary L				Treatment considered adequate.	no					
Caledonia	Thornapple River	Primary ST	740			raw sewage	no					
Carson City	Fish Creek	None	1,200				no					
Casnovia	Hall Creek	None	371			Final Order adopted September 19, 1968.	no					
Cedar Springs	Cedar Creek	Secondary L	1,770			Treatment considered adequate.	no					
Coopersville	Deer Creek	Secondary TF	1,580	73	72	plant overloaded	no					
Delhi Township	Grand River	Primary	5,000	127	87	Statutory proceedings to be initiated by January 1, 1969.	yes	x		3-1-71	12-1-71	12-1-72

Community	Receiving Waters	Treatment Provided	Population (1964 est.)	Discharge Characteristics		Status and Abatement Action	Affect Lake Michigan Water Quality	IMPROVEMENT NEEDS		PROGRAM FOR REMEDIAL FACILITIES Staff objectives subject to Commission review		
				5-day BOD Effluent mg/l	Suspended Solids Effluent mg/l			Nutrient Reduction	New or Improved Treatment	Plans Approved	Start Construction	Complete
Delta Township	Grand River	Secondary AS	7,600	21	12	Stipulation to be developed by January 1, 1969.	yes	X		3-1-71	12-1-71	12-1-72
DeWitt	Looking-glass River	Primary	1,240	190	136		no					
DeWitt Township	Looking-glass River	None	7,600			Circuit Court Order June 27, 1968	yes	X		9-1-68	3-1-69	3-1-70
Dimondale	Grand River	None	900			Enforcement procedures initiated July 25, 1968.	no					
Edmore	Stoney Creek	Secondary L	1,240			Treatment considered adequate.	no					
East Lansing	Red Cedar River	Secondary AS	37,800	29	87	Statutory proceedings to be initiated by January 1, 1969.	yes	X		3-1-71	12-1-71	12-1-72
Eaton Rapids	Grand River	Primary	4,300	234	145	Statutory proceedings to be initiated by January 1, 1969.	yes	X		3-1-71	12-1-71	12-1-72
Fowler	Peet Creek	Secondary TF	850	59	37	Treatment considered adequate.	no					
Fowler-ville	Red Cedar River	Secondary L	1,670			Treatment considered adequate.	no					
Gaines Township (Cutlerville)	Buck Creek	None				Kent County Department of Public Works project connecting wastes to Wyoming system.	yes				under construction	
Gaines Township (Dutton)	Plaster Creek	None					no					
Grand Haven	Grand River	Primary	11,700	71	56	Stipulation to be developed by January 1, 1969.	yes	X		3-1-71	12-1-71	12-1-72
Grand Ledge	Grand River	Primary	5,500	111	86	Statutory proceedings to be initiated by January 1, 1969.	yes	X		3-1-71	12-1-71	12-1-72
Grand Rapids	Grand River	Secondary AS	220,300	13	21	Stipulation to be developed by January 1, 1969.	yes	X		3-1-71	12-1-71	12-1-72
Grand-ville	Grand River	Secondary AS	8,500	13	9	Stipulation to be developed by January 1, 1969.	yes	X		3-1-71	12-1-71	12-1-72
Grant	Crockery Creek	Secondary TF	730	20	41	Treatment considered adequate.	no			3-1-71	12-1-71	
Green-ville	Flat River	Primary	7,200	118	74	Stipulation to be developed by January 1, 1969.	yes	X		3-1-71	12-1-71	12-1-72
Hastings	Thorn-apple River	Primary	7,000	165	115	Stipulation to be developed by January 1, 1969.	yes	X		3-1-71	12-1-71	12-1-72

Community	Receiving Waters	Treatment Provided	Population (1964 est.)	Discharge Characteristics		Status and Abatement Action	Affect Lake Michigan Water Quality	IMPROVEMENT NEEDS		PROGRAM FOR REMEDIAL FACILITIES Staff objectives subject to Commission review		
				5-day BOD Effluent mg/1	Suspended Solids Effluent mg/1			Nutrient Reduction	New or Improved Treatment	Plans Approved	Start Construction	Complete
Hudsonville	Buttermilk Creek	None	2,600			Agreement to connect to Grandville dated February 20, 1968.	yes	x				
Ionia	Grand River	Primary	6,750	59	72	Stipulation to be developed by January 1, 1969.	yes	x		3-1-71	12-1-71	12-1-72
Jackson	Grand River	Secondary AS	48,500	8	16	Tertiary treatment program underway.	yes	x				
Kent City	Ball Creek	Secondary SF	620			Treatment considered adequate.	no					
Kent County Airport	Plaster Creek	Secondary L	5,000			Treatment considered adequate.	no					
Laingsburg	Lookingglass River	None	1,000			Final Order Adopted April 25, 1965	no					
Lake Odessa	Little Thornapple River	Secondary TF	1,810	65	63	Final Order adopted August 29, 1967 Corrective program underway.	no					
Lakeview	Tamarack Creek	Secondary L	1,130			Treatment considered adequate.	no					
Lansing	Grand River	Secondary AS	122,000	9	27	Stipulation to be developed by January 1, 1969.	yes	x		3-1-71	12-1-71	12-1-72
Leoni Township, Jackson County	Grand River	None	5,000			To connect to Jackson system.	yes	x				12-1-72
Leslie	Huntoon Creek	Primary	1,810	78	87		no					
Lowell	Grand River	Primary ST	2,600	73	32	Statutory proceedings to be initiated by January 1, 1969.	yes	x		3-1-71	12-1-71	12-1-72
Lyons	Grand River	None	700				no					
Mason	Grand River	Secondary AS	5,000	3	8	Stipulation to be developed by January 1, 1969.	yes	x		3-1-71	12-1-71	12-1-72
Michigan Reformatory (Ionia)	Grand River	Primary	2,500	155	78		yes	x		3-1-71	12-1-71	12-1-72
Middleville	Grand River	Primary IT	1,200				no					
Nashville	Thornapple River	Primary	1,525		76		no					

				Discharge Characteristics				IMPROVEMENT NEEDS		PROGRAM FOR REMEDIAL FACILITIES Staff objectives subject to Commission review		
Community	Receiving Waters	Treatment Provided	Population (1964 est.)	5-day BOD Effluent mg/l	Suspended Solids Effluent mg/l	Status and Abatement Action	Affect Lake Michigan Water Quality	Nutrient Reduction	New or Improved Treatment	Plans	Start Constuction	Complete
Ottawa County (Grand Valley State College)	Grand River	Secondary L				Treatment considered adequate.	no					
Ovid	Maple River	None	1,500			Final Order adopted July 28, 1967.	no					
Paris Township (now City of Kentwood)	Plaster Creek	None	19,000			City of Grand Rapids and Kent County Department of Public Works constructing collection system. Wastes to Grand Rapids plant.	yes	x			under construction	
Parma	McKay Brook and Sandstone Creek	None	800			Final Order adopted April 27, 1967. Enforcement proceedings in progress.	no					
Perry	Looking-glass River	None	1,400				no					
Pewamo	Stony Creek	None 400					no					
Pine Rest Hospital (Cutlerville)	Buck Creek	Secondary AS	500			Treatment considered adequate	no					
Plainfield Township, Kent County	Grand River York & Mill Creeks and Lamberton Lake	None	12,000			To connect with Grand Rapids system through Kent County Department of Public Works, under construction.	yes	x			under construction	7-1-69
Portland	Grand River	Primary	3,500	147	145	Statutory proceedings to be initiated by January 1, 1969.	yes	x				12-1-72
Rockford	Rogue River	Primary	2,075	71	59	To connect with Grand Rapids system through Kent County Department of Public Works, under construction.	yes	x			under construction	7-1-69
Sand Lake	Black Creek	Secondary L	395			Treatment considered adequate.	no					
St. Johns	Hayworth Creek	Secondary TF	5,900	13	30	Statutory proceedings to be initiated by January 1, 1969.	yes	x				12-1-72
Saranac	Lake Creek	Secondary L	1,100			Lagoon completed October 1, 1968.	no				September, 1967	10-1-68
Sparta	Nash Creek	Secondary TF	3,000	34	47	Stipulation to be developed by January 1, 1969.	yes	x				12-1-72
Spring Lake	Grand River	Primary IT	2,060	114	84	Stipulation to be developed by January 1, 1969.	yes	x				12-1-72

				Discharge Characteristics			Affect	IMPROVEMENT NEEDS		PROGRAM FOR REMEDIAL FACILITIES Staff objectives subject to Commission review		
Community	Receiving Waters	Treatment Provided	Population (1964 est.)	5-day BOD Effluent mg/l	Suspended Solids Effluent mg/l	Status and Abatement Action	Lake Michigan Water Quality	Nutrient Reduction	New or Improved Treatment	Plans	Start Construction	Complete
Stanton	Fish Creek	Secondary L	1,200			Treatment considered adequate.	no					
State Prison of Southern Michigan (Jackson)	Grand River	Secondary TF	6,500	31	47		yes	x				
Vermontville	Thornapple River	None	800			Final Order adopted September 27, 1967.	no					
Walker	Tallman Creek	None	8,270			Kent County Department of Public Works constructing system to transport wastes to City of Grand Rapids.	yes	x			under construction	12-31-68
Webberville	Red Cedar River	None	700			Final Order adopted January 17, 1968.	no					
Williamston	Grand River	Primary	2,215	145	90	Statutory proceedings to be initiated by January 1, 1969.	yes	x		3-1-71	12-1-71	12-1-72
Woodland	McArthur Drain and Woodland Drain	Primary IT	375	19	9	Final Order adopted January 28, 1959.	no					
Wyoming	Grand River	Secondary TF	52,000	19	33	Stipulation to be developed by January 1, 1969.	yes	x		3-1-71	12-1-71	12-1-72
22. BLACK (HOLLAND)												
Holland	Lake Macatawa	Primary	24,800	82	63	Stipulation to be developed by January 1, 1969.	yes	x		3-1-71	12-1-71	12-1-72
Jamestown Township	Black River	None	500				no					
Zeeland	Black River	Secondary AS	3,900	9	23	Statutory proceedings to be initiated by January 1, 1969.	yes	x		3-1-71	12-1-71	12-1-72
Zeeland Township, Ottawa County	Black River	None					no					
23. KALAMAZOO												
Albion	Kalamazoo River	Primary	12,800	77	67	Stipulation to be developed by January 1, 1969.	yes	x		3-1-71	12-1-71	12-1-72
Allegan	Kalamazoo River	Primary IT	5,000	149	107	Stipulation to be developed by January 1, 1969.	yes	x		3-1-71	12-1-71	12-1-72
Battle Creek	Kalamazoo River	Secondary TF	40,700	98	58	Stipulation to be developed by January 1, 1969.	yes	x		3-1-71	12-1-71	12-1-72
Bellevue	Battle Creek River	None	1,300			Final Order adopted December 15, 1966.	no					

				Discharge Characteristics				IMPROVEMENT NEEDS		PROGRAM FOR REMEDIAL FACILITIES Staff objectives subject to Commission review		
Community	Receiving Waters	Treatment Provided	Population (1964 est.)	5-day BOD Effluent mg/l	Suspended Solids Effluent mg/l	Status and Abatement Action	Affect Lake Michigan Water Quality	Nutrient Reduction	New or Improved Treatment	Plans	Start Construction	Complete
Charlotte	Battle Creek River	Secondary TF	8,100	43	116	Stipulation to be developed by January 1, 1969.	yes	x		3-1-71	12-1-71	12-1-72
Concord	Kalamazoo River	None	1,000				no					
Douglas	Kalamazoo River	Septic tanks tile fields	600				no					
Fennville	Mann Creek	Secondary L	705			Treatment considered adequate.	no					
Galesburg	Kalamazoo River	None	1,410			Final Order adopted September 21, 1968.	no					
Hopkins	Rabbit River	None	550			Final Order adopted May 28, 1968.	no					
Kalamazoo	Kalamazoo River	Secondary AS	84,200	18.5	82	Stipulation to be developed by January 1, 1969.	yes	x		3-1-71	12-1-71	12-1-72
Marshall	Kalamazoo River	Primary	6,700	62	43	Stipulation to be developed by January 1, 1969.	yes	x		3-1-71	12-1-71	12-1-72
Olivet	Indian Creek	Secondary L	1,185			Treatment considered adequate.	no					
Otsego	Kalamazoo River	Secondary TF	4,300	183	65	Stipulation to be developed by January 1, 1969.	yes	x		3-1-71	12-1-71	12-1-72
Parchment	Kalamazoo River	Secondary TF	1,565	27	27	Treatment considered adequate.	no					
Plainwell	Kalamazoo River	Secondary TF	3,400	53	74	Stipulation to be developed by January 1, 1969.	yes	x		3-1-71	12-1-71	12-1-72
Portage (part)	Kalamazoo River	Secondary AS	1,400	25	16	Treatment considered adequate.	no					
Saugatuck	Kalamazoo River	Primary	925	177	122	Final Order adopted July 26, 1950.	no					
Spring Arbor	Kalamazoo River	Secondary L	700			Treatment considered adequate.	no					
Springfield	Kalamazoo River	Secondary TF	4,600			Connected to Battle Creek system.	yes	x				
Springport	Rice Creek	None	690			Final Order adopted May 28, 1966.	no					
24. BLACK (SOUTH HAVEN)												
Bangor	Black River and Maple Creek	Secondary L	2,110			Treatment considered adequate.	no					
Bloomingdale	Black River	None	460			Final Order adopted May 28, 1968.	no					

				Discharge Characteristics				IMPROVEMENT NEEDS		PROGRAM FOR REMEDIAL FACILITIES Staff objectives subject to Commission review		
Community	Receiving Waters	Treatment Provided	Population (1964 est.)	5-day BOD Effluent mg/l	Suspended Solids Effluent mg/l	Status and Abatement Action	Affect Lake Michigan Water Quality	Nutrient Reduction	New or Improved Treatment	Plans	Start Construction	Complete
South Haven	Black River	Secondary AS	6,400	12	13	Stipulation to be developed by January 1, 1969.	yes	x				12-1-72
25. PAW PAW												
Benton Township (part)		Secondary AS	26,000			Treatment provided by City of Benton Harbor	yes					
Coloma	Paw Paw River	Primary	1,470	141	91		no					
Hartford	Paw Paw River	Primary	2,305	97	190		yes	x		3-1-71	12-1-71	12-1-72
Lawrence	Paw Paw River	Primary	770				no					
Lawton	Paw Paw River	Secondary L	1,400			Treatment considered adequate.	no					
Paw Paw	Paw Paw River	Primary	3,100	236	118	Statutory proceedings to be initiated by January 1, 1969.	yes	x				
Watervliet	Paw Paw River	Primary	1,820				no			3-1-71	12-1-71	12-1-72
26. ST. JOSEPH (MICH.)												
Andrews University, Berrien Springs	St. Joseph River	Secondary TF	2,100			Secondary treatment completed 1968.	yes	x		3-1-71	12-1-71	12-1-72
Benton Harbor and St. Joseph	St. Joseph River	Secondary AS	15,600	13	22	Stipulation to be developed by January 1, 1969.	yes	x		3-1-71	12-1-71	12-1-72
Berrien Springs	St. Joseph River	Primary	1,950	76	83	Stipulation to be developed by January 1, 1969.	yes	x		3-1-71	12-1-71	12-1-72
Branch County Medical Facilities		Primary					no					
Bronson	Swan Creek	Secondary TF	2,270	30	55	Stipulation to be developed by January 1, 1969.	yes	x		3-1-71	12-1-71	12-1-72
Buchanan	St. Joseph River	Primary	5,800	62	53	Stipulation to be developed by January 1, 1969.	yes	x		3-1-71	12-1-71	12-1-72
Cassopolis	Ground waters	Secondary L & SI	2,030				no					
Centreville	Prairie River	None	975			Final Order adopted May 28, 1968.	no					
Coldwater	Coldwater River	Secondary TF	9,700	19	27	Statutory proceedings to be initiated by January 1, 1969.	yes	x		3-1-71	12-1-71	12-1-72
Coldwater State Home and Training School	Mudd Creek	Secondary AS		13	14		yes	x		3-1-71	12-1-71	12-1-72

				Discharge Characteristics				IMPROVEMENT NEEDS		PROGRAM FOR REMEDIAL FACILITIES Staff objectives subject to Commission review		
Community	Receiving Waters	Treatment Provided	Population (1964 est.)	5-day BOD Effluent mg/l	Suspended Solids Effluent mg/l	Status and Abatement Action	Affect Lake Michigan Water Quality	Nutrient Reduction	New or Improved Treatment	Plans	Start Construction	Complete
Constantine	St. Joseph River	Primary	1,710	195	121	Conference before Commission to be scheduled by January 1, 1969.	yes	x		3-1-71	12-1-71	12-1-72
Dowagiac	Dowagiac Creek	Primary	7,600	100	63	Stipulation to be developed by January 1, 1969	yes	x		3-1-71	12-1-71	12-1-72
Eau Claire	Farmers Creek	None	565				no					
Glen Oaks Community College, Centreville	Prairie River	None				Order of Determination adopted April 28, 1966. New Order April 24, 1968.	no					
Hillsdale	St. Joseph River	Secondary TF	7,000	30	43	Stipulation to be developed by January 1, 1969.	yes	x		3-1-71	12-1-71	12-1-72
Jonesville	St. Joseph River	None	1,900			Final Order adopted January 17, 1968.	no					
Litchfield	St. Joseph River	None	1,000			Final Order adopted January 17, 1968.	no					
Niles	St. Joseph River	Primary	15,800	47	69	Stipulation to be developed by January 1, 1969.	yes	x				12-1-72
Quincy	Marble Lake	Primary	1,600	77	76		no					
Reading	Unnamed Drains	None	1,130			Enforcement procedures initiated September 20, 1968.	no					
Stevensville	Hickory Creek	None	700			Final Order adopted May 26, 1967.	no					
Sturgis	White Pigeon River	Secondary TF	9,500	39	62	Stipulation to be developed by January 1, 1969.	yes	x				12-1-72
Three Rivers	St. Joseph River	Primary	7,400	59	60	Conference before Commission to be scheduled by January 1, 1969.	yes	x				12-1-72
Union City	St. Joseph River	Secondary L	1,670			Treatment considered adequate.	no					
Vicksburg	Portage Creek	Secondary TF	2,220	75	91	Statutory proceedings to be initiated by January 1, 1969.	yes	x				12-1-72
MISCELLANEOUS DRAINAGE AREAS												
Bridgman	Tanner Creek	Secondary L	1,450			Treatment considered adequate.	no					
Chikaming Township (Sawyer, Lakeside, Union Pier)	Galien River	None	2,132			Final Order adopted March 26, 1968.	yes			12-1-68	10-1-69	10-1-70

Community	Receiving Waters	Treatment Provided	Population (1964 est.)	Discharge Characteristics		Status and Abatement Action	Affect Lake Michigan Water Quality	IMPROVEMENT NEEDS		PROGRAM FOR REMEDIAL FACILITIES Staff objectives subject to Commission review		
				5-day BOD Effluent mg/l	Suspended Solids Effluent mg/l			Nutrient Reduction	New or Improved Treatment	Plans	Start Construction	Complete
Escanaba	Portage Creek	Secondary AS & TF	15,000	28	30	Stipulation to be developed by January 1, 1969.	yes	x		3-1-71	12-1-71	12-1-72
Galien	Galien River	None	750				no					
Harbor Point	Lake Michigan	Primary ST	800			Stipulation to be developed by January 1, 1969	yes	x	x	9-1-70	6-1-71	12-1-72
Harbor Springs	Lake Michigan	Primary FS	1,430			Stipulation to be developed by January 1, 1969.	yes	x	x	9-1-70	6-1-71	12-1-72
Lake Township	Painterville Drain	None	2,020			Corrected by upgrading individual systems.	no					10-30-67 (Completed)
New Buffalo	Galien River	Secondary AS	2,130	92	231	Statutory proceedings to be initiated by January 1, 1969.	yes	x				12-1-72
New Buffalo Township (Union Pier area)	Galien River	None				Final Order adopted March 26, 1968.	yes			12-1-68	10-1-69	10-1-70
Onekama	Portage Lake	None	470			raw sewage	no					
Petoskey	Lake Michigan	Primary CP	6,400	174	77	Stipulation to be developed by January 1, 1969.	yes	x	x			12-1-72
Suttons Bay	Lake Michigan	Secondary L	420			Treatment considered adequate.	no					
Three Oaks	Deer and Spring Creeks	None	1,800			Final Order adopted February 23, 1967	no					
Wequetonsing	Lake Michigan	Primary IT	1,000			Conference before Commission to be scheduled by January 1, 1969.	yes	x	x			12-1-72

Abbreviations

FS	Fine Screen
CP	Chemical Precipitation
ST	Septic Tank
IT	Imhoff Tank
AS	Activated Sludge
TF	Trickling Filter
L	Lagoons
SF	Sand Filter
SI	Spray Irrigation

APPENDIX G

DIRECT INDUSTRIAL DISCHARGES TO LAKE MICHIGAN

Company Name	Product	Location	Treatment	Discharge Characteristics after Treatment Flow MGD	 5-day BOD lbs/day	 Suspended Solids lbs/day	Pollution Status	Date of Order of Determination	Status and Abatement Action	Affects Lake Michigan Water Quality
1. **Bay Street Steam Plant**	Electricity	Traverse City		26.0			A	June 1, 1966	Control adequate	No
2. **Cherry Growers, Inc.**	Canning products	Suttons Bay	Screening	0.8	No Data Available		A		Seasonal operation, Control adequate	No
3. **Consumers Power Company**	Electricity	Port Sheldon	Temperature control	175	No Data Available		A		Control adequate	No
4. **Consumers Power Company**	Electricity	Big Rock Point		72.0			A	November 1, 1960	Annual reports submitted on radioactive content of effluent	No
5. **Dow Chemical Company**	Chemicals	Ludington		1.0		1,000	A		Brine wastes to Lake Michigan. Control adequate	No
6. **E. I. duPont de Nemours and Company**	Synthetic rubber, freon acetylene	Montague	Septic tank, coagulation, sedimentation disc. 1500 off shore	17.3	4,328		A	June 25, 1964	Control adequate	No
7. **Frigid Foods, Inc.**	Canned cherries	Suttons Bay	Screening, city sewer	- - No Data Available - -			A	December 20, 1963	Control adequate	No
8. **Inland Lime and Stone Company, Division Indiana Steel Company**	Limestone and wash aggregate	Gulliver	Septic tank and settling basins	0.168		40.6 (8 hours)	A		Control adequate	No
9. **Leelanau Fruit Company**	Processed cherries	Suttons Bay	Vibrating screens and chlorination	- - No Data Available - -			C	June 25, 1963		[illegible]
10. **Medusa Portland Cement**	Cement	Charlevoix	Package treatment plant	- - No Data Available - -			A	April 28, 1966	Control adequate	No
11. **Morgan McCool**	Food products	Traverse City	Screening	.547	1,866	109	E		Plans to relocate to off-water location or to connect to municipal system by 1970.	Yes
12. **Northport Cherry Factory**	Canned cherries	Northport	Vibrating screens	- - No Data Available - -			A		Control adequate	No
13. **Packaging Corporation of America**	Paper-board	Filer City	Sedimentation	10.0	20,000	13,500	B_s	September 24, 1959	Plans for secondary treatment being developed	Yes
14. **Penn-Dixie Cement Corporation**	Cement	Petoskey	Septic tank settling ponds	- - No Data Available - -			A		Control adequate	No
15. **U. P. Power Company**	Electricity	Escanaba	- - - - - - No Data Available - - - - - -				A		Cooling waters only. Control adequate	No

INDUSTRIAL SURFACE WATER DISCHARGES IN THE LAKE MICHIGAN BASIN 1968

Company Name	Product	Location	Receiving Stream	Treatment Provided	Discharge Characteristics after Treatment			Pollution Status Rating	Date of Order of Determination	Remarks	Affects Lake Michigan Water Quality
					Flow MGD	5-day BOD lbs/day	Suspended Solids lbs/day				
UPPER PENINSULA											
1. Menominee River Basin											
American Can Company, Menominee Mill	Wax paper	Menominee	Menominee River	Pederson and vacuum disc save-alls	1.226	1,668	5,489	C		Additional control facilities being installed	Yes
Daggett Cheese Company	Cheese	Daggett	Little Cedar River	Septic tank, whey hauled, floor wash to swamp				A		Control adequate.	No
Hanna Mining Company (Homer-Wauseca)	Mining iron ore	Iron River	Iron River	Septic tank, lagoon for mine drainage	3.40	---	3,920	A		Control adequate.	No
Hanna Mining Company (Groveland Mine)	Mining iron ore	Randville	Pine Creek	Lagoons	1.1			A	March 27 & 28, 1958	Control adequate.	No
Inland Steel Company	Mining iron ore	Iron River	Iron River	Septic tank, lagoon for acid mine drainage	0.90		252	A		Control adequate	No
Palestine Cheese Company	Cheese	Stephenson	Little Cedar River	Septic tank haul whey	0.02			A		Control adequate.	No
Scott Paper Company	Gr. wood and pulp	Menominee	Menominee River	Side hill save-alls	0.075			A		Control adequate	No
White House Milk Company	Butter and powdered milk	Stephenson	Little Cedar River	Comb. waste secondary treatment, trickling filter	0.0396	46	42.3	A	January 28, 1959	Control adequate.	No
2. Cedar River Basin											
- - - - - - - - - No major industries located in the basin - - - - - - - - -										- - - - - - - -	---
3. Ford River Basin											
- - - - - - - - - No major industries located in the basin - - - - - - - - -										- - - - - - - -	---
4. Escanaba River Basin											
Mead Corporation, Escanaba Division	Coated paper	Escanaba	Escanaba River	Secondary, trickling filter, Pederson save-all	4.3	9,850	30,600	E_c		Aerated lagoon for process wastes under construction.	Yes
5. Days River Basin											
- - - - - - - - - No major industries located in the basin - - - - - - - - -										- - - - - - - -	---
6. Rapid River Basin											
Michigan Milk Producers Association, Rapid River Division	Milk Products	Rapid River	Rapid River	Septic tank, haul whey				A	October 24, 1950	Control adequate.	No
7. Whitefish River Basin											
- - - - - - - - - No major industries located in the basin - - - - - - - - -										- - - - - - - -	No
8. Sturgeon River Basin											
- - - - - - - - - No major industries located in the basin - - - - - - - - -										- - - - - - - -	---

Company Name	Product	Location	Receiving Stream	Treatment Provided	Flow MGD	5-day BOD lbs/day	Suspended Solids lbs/day	Pollution Status Rating	Date of Order of Determination	Remarks	Affects Lake Michigan Water Quality
9. Manistique River Basin											
Manistique Pulp and Paper Company	Paper	Manistique	Manistique River	City sewer, save-all, ponds	2.028	2,729	16,572	B	March 26, 1964		No
LOWER PENINSULA											
10. Pine River Basin											
East Jordan Canning Company	Vegetable and fruit	East Jordan	Jordan River	City sewer, lagoons				B			No
Howes Leather Company, Inc.	Tannery	Boyne City	Lake Charlevoix	Primary settling	0.500	1,800	3,000	E_s	September 29, 1954	Secondary treatment by June 1, 1972	No
Northern Michigan Electric Co-op	Power	Advance	Lake Charlevoix	Settling lagoon for fly ash				A	September 29, 1965	Control adequate	[illegible]
11. Elk River Basin											
Columbia Fruit Division, Michigan Fruit Canners, Inc.	Vegetable canning	Ellsworth	Intermediate Lake	Spray irrigation, vibrating screens	0.569	1,713	3,037	A		Control adequate	No
Elk Rapids Packing Company	Cherry canning	Elk Rapids	Elk Lake	Screening and chlorination	0.500	800	160	B_s		Seasonal operation	No
Faas Foods, Inc.	Vegetable canning	Central Lake	Intermediate Lake	Rotary screen						Ceased operations	No
Lamina Tool and Die Corporation	Plating	Bellaire	Intermediate Lake and Cedar River	Batch treatment of cyanide				A		Control adequate	No
Michigan Fruit Canners	Canned fruit	Ellsworth	Ellsworth Lake		3.628	1,980	3,537	A		Control adequate	No
12. Boardman River Basin											
Chef Pierre, Inc.	Pies	Traverse City	Boardman Lake	Septic tank, dry well				A		Control adequate	No
Parsons Corporation	Tube fabrication	Traverse City	Mitchell Creek	Settling lagoon				A	August 29, 1963	Control adequate	No
Traverse City Canning Company	Canned fruit	Traverse City	Boardman River	Screening	0.547	1,866	109	E		To connect to municipal system by December 1, 1971	Yes
13. Betsie River Basin											
Elberta Packing Company	Canned fruit	Elberta	Betsie Lake	Screening				B			No
Pet, Inc.	Frozen cherries	Frankfort	Betsie Lake	Screening	0.420	760	150	B			No
Pet Milk Company, Pet-Ritz Foods Division	Pies, apple and cherry	Frankfort	Betsie Lake	Screening	0.600	930	235	B			[illegible]
14. Manistee River Basin											
Hardy Salt Company	Salt	Manistee	Manistee Lake	Settling lagoon	8.0			B			No
Michigan Chemical Corporation	Bromine chemicals	East Lake	Manistee Lake	Condenser	0.120	Negligible	17	A		Control adequate	No
Morton Salt and Chemical Company	Salt, magnesium, bromine	Manistee	Manistee Lake	Eductors	15	Negligible	19,000	B	April 30, 1959		No
Packaging Corporation of America, American Box Board Division	Paper board	Filer City	Manistee Lake	Settling lagoons	5.00	2,000	5,000	E	September 24, 1959	Plans underway for secondary treatment with effluent to Lake Michigan.	No
15. Big Sable River Basin											
- - - - - No major industries located in the basin - - - - -										- - - - -	
16. Lincoln River Basin											
- - - - - No major industries located in the basin - - - - -										- - - - -	

Company Name	Product	Location	Receiving Stream	Treatment Provided	Discharge Characteristics after Treatment: Flow MGD	5-day BOD lbs/day	Suspended Solids lbs/day	Pollution Status Rating	Date of Order of Determination	Remarks	Affects Lake Michigan Water Quality
LOWER PENINSULA CONTINUED											
17. Pere Marquette River Basin											
Dow Chemical Company	Chemicals	Ludington	Pere Marquette River	Clarifier, lagoon	44.5		7,000	A	May 22, 1957		No
Harbison-Walker Refractories Company	Magnesite	Ludington	Pere Marquette River	Clarifiers, coagulant acids	5.3	Neg-ligible	500	B	March 23, 1961	Control adequate.	No
Sanders Meat Packing Company	Meat Packing	Custer	Black River	Lagoon	- - No Data Available - -			D			No
Stokely-Van Camp, Inc.	Cannery	Scottville	Pere Marquette River	Screening and chlorination	0.500	300	475	A	May 24, 1956	Seasonal operation.	No
18. Pentwater River Basin											
- - - - - - - - No major industries located in the basin - - - - - - - -										- - - - - - - -	---
19. White River Basin											
Hooker Chemical Company	Chemicals Cl_2 - Caustic, HCL	Montague	White Lake	Sedimentation, sand filtration, chlorination	0.900		3,000	B	June 28, 1956	Control adequate. Program for reducing chlorides and sulfates underway.	No
Whitehall Leather Company, Division of Genesco	Tanning	Whitehall	White Lake	Lagoon to lake	1.2	2,100	638	B_{spc}		Completion of secondary treatment planned for Dec. 1, 1971.	No
20. Muskegon River Basin											
Brooks and Perkins, Inc., Cadillac Manufacturing Division	Aluminum sheet preparation	Cadillac	Clam River	Ion exchange	- - No Data Available - -			A		Control adequate.	No
Campbell, Wyant and Cannon Foundry Company	Castings	Muskegon	Ruddiman Drain	Oil recovery	- - No Data Available - -			A		Control adequate.	No
Central Concrete Products Company	Washed gravel	Big Rapids	Muskegon River	Settling ponds	0.079		54	A		Control adequate.	No
Consumers Power Company, B.C. Cobb Plant	Electric power	Muskegon	Muskegon River	Settling lagoons for sludge and fly ash	450	No Data Available		A		Control adequate.	No
Continental Motors Corporation, Downtown	Auto engines	Muskegon	Muskegon Lake	Oil separator	0.81	130	450	D_{pc}		Corrective facilities under construction.	No
Continental Motors Corporation, Getty Street Plant	Auto engines	Muskegon	Muskegon River	CN and chrome treatment, oil separation, acid neutralizing	0.46	38	196	A		Control adequate	No
Denham Manufacturing Company	Electro-plating	Big Rapids	Muskegon River	Cr treatment	0.303	46	54	A	May 24, 1956	Control adequate.	No
Evart Products Company	Plastics	Evart	Twin Creek	Cooling water	- - No Data Available - -			A		Control adequate	No
Gerber Products Company	Baby food	Fremont	Darling Creek and Fremont Lake	Spray irrigation, cooling water to stream	1.0	No Data Available		A		Control adequate.	No
H. J. Heinz Company	Pickles	Lakeview	Tamarack Lake	Screening	- - No Data Available - -			B		Control adequate.	No
Kaydon Engineering Corporation	Bearings	Muskegon	South Branch Ruddiman Creek	Clarifiers	0.145	2.4	6.2	A	October 27, 1966	Control adequate.	No
Lakeway Chemicals, Inc.	Alcohol base detergents and dye intermedias	Muskegon	Black River and Mona Lake	Seepage lagoons	0.344	700	7,500	E_s	May 24, 1962		No
Liberty Dairy Company	Bottling plant	Evart	Muskegon River	Wash and cooling water	0.171	161	143	A	August 24, 1966	Control adequate	No
Naph Sol Refining Company	Petroleum refining	North Muskegon	Muskegon River	API separator and lagoon	5.0	175	405	A	July 24, 1958	Control adequate.	No
Ott Chemical Company	Organic chemicals	Muskegon	Little Bear Creek	Equalization, aeration, incineration	0.4175	1,045		B	August 29, 1967		No
Paris Gravel Company	Washed sand and gravel	Big Rapids	Muskegon River	Settling ponds	0.128		94	A		Control adequate.	No

Company Name	Product	Location	Receiving Stream	Treatment Provided	Discharge Characteristics after Treatment			Pollution Status Rating	Date of Order of Determination	Remarks	Affects Lake Michigan Water Quality
					Flow MGD	5-day BOD lbs/day	Suspended Solids lbs/day				
LOWER PENINSULA CONTINUED											
Muskegon River Basin Continued											
Sealed Power Corporation	Auto parts	Muskegon Heights	Ruddiman Drain and Mona Lake	Reduction of chrome	- - No Data Available - -			B			No
Speas Company	Apple juice	Fremont	Cole Drain, Brooks Creek and Fremont Lake	Cooling water to stream	1.12	No Data Available		A	July 26, 1961	Control adequate	No
Wallace Stone Company	Washed stone and gravel	Hersey	Muskegon River	Settling ponds	0.128		198	B			No
Warren, S. D., Company	Paper pulp	Muskegon	Muskegon Lake	Clarifiers, save-all, sludge lagoons	12.0	13,000	18,000	E	December 7, 1955	Secondary treatment to be provided by December 1, [illegible]	No
21. Grand River Basin											
Allen Packing Company	Slaughter-packing	Charlotte	County farm drain	Lagoon	- - No Data Available - -			A		Control adequate	No
American Motors Corporation, Kelvinator Division	Appliances	Wyoming	Plaster Creek	Chemical treatment, connection to municipal system	- - No Data Available -			A		Cooling water to stream	No
Amway Corporation	Home cleaning products	Ada	Grand River	Stabilization lagoons	0.063	809	187	B	July 23, 1964		No
A.S.P. and Manufacturing Company	Plating	Grand Haven	Grand River	Chemical precipitation neutralization	0.084	No Data Available		A		Control adequate.	No
Attwood Corporation	Cadmium plating	Lowell	Flat River	Cyanide, copper and chrome reduction	0.20		54	B	December 15, 1960		No
Aunt Jane's Foods, Division of the Borden Company	Pickle processing	Edmore	Stoney Creek	Screening	0.0242	74.7	29.8	E_c	June 28, 1967	New treatment facilities under construction	No
Bissell, Inc. Sanitary sewage Industrial wastes	Sheet metal parts fabrication	Walker	Indian Mill Creek	Settling tanks	0.03	20	16	 A A	April 24, 1958		No
Challenge Porcelain Company	Bathtubs	Grand Haven	Grand River	None	0.090		25	E		Facilities under design.	No
Clark Equipment Company	Machinery	Jackson	Grand River	Lagoon		12		D		Occasional loss of oil to river	No
Crystal Refining Company	Oil refining	Carson City	Fish Creek	Oil removal	0.043	3		B		Additional separator capacity under design.	No
Detroit Gasket and Manufacturing Company, Extruded Metal Division	Extrusion and aluminum anodizing	Belding	Flat River	Phosphate and oil removal	0.70	6.0	150	B			No
Duffy-Mott Corporation	Cherry canning	Bailey	Fish Creek	Seepage lagoon, spray irrigation	- - No Data Available - -			B	March 25, 1965		No
Eagle Ottawa Leather Company	Hide tanning	Grand Haven	Grand River	Screening	1.4	16,000	24,000	E_s	September 28, 1960	Additional treatment under study.	No
Federal Mogul	Lead, tin, copper plating	Greenville	Flat River	Chemical treatment, lagoons	0.725		182	A		Control adequate	No
General Motors Corporation, Diesel Equipment Division	Metal manu-facturing	Wyoming	Plaster Creek	Cyanide and chrome reduction, settling ponds	2.120	8		B	November 30, 1967		No
General Motors Corporation, Oldsmobile Forge Division	Forgings	Lansing	Grand River	Oil removal	- - No Data Available - -			A		Control adequate.	No
General Motors Corporation, Oldsmobile Division	Crank shafts and connecting rods	Delta Township, Eaton County	Jenne Drain	Chemical treatment, lagoon	0.072	2		A	February 24, 1960	Control adequate.	No

Company Name	Product	Location	Receiving Stream	Treatment Provided	Discharge Characteristics after Treatment Flow MGD	5-day BOD lbs/day	Suspended Solids lbs/day	Pollution Status Rating	Date of Order of Determination	Remarks	Affects Lake Michigan Water Quality
LOWER PENINSULA CONTINUED											
Grand River Basin Continued											
Gibson Division, Hupp Corporation	Appliances	Greenville	Flat River	Lagoon	0.484	4	454	A		Additional treatment under design.	No
Gibson Division, Hupp Corporation	Applicances	Belding	Flat River	Oil separator	- - No Data Available - -			B			No
Grand Rapids Brass Company	Zinc die casting	Wyoming	Buck Creek	Cooling waters	- - No Data Available - -			A	March 25, 1965	Control adequate	No
Hastings Aluminum Products, Inc.	Aluminum coating	Hastings	Fall Creek		- - No Data Available - -			A		Control adequate	No
Hastings Manufacturing Company	Auto parts	Hastings	Thornapple River	Chrome and oil removal	0.28	No Data Available		A	November 30, 1961		No
Hilfinger Jackson Corporation	Zinc plating, auto parts	Jackson	Grand River	Cooling and anodize rinse to river and phosphate recovery	0.24	15		B	May 22, 1957		No
Hoover Ball and Bearing Company, Utilex Division	Plating	Fowlerville	Red Cedar River	Cyanide and chrome settling lagoon, oil skimmer	0.350	20	120	B	January 28, 1953		No
Hudsonville Dairy	Dairy	Hudsonville	Rush Creek to Grand River	Septic tank	0.33	20	35	D		To connect to municipal system	No
Indian Summer, Inc.	Apple juice and vinegar	Belding	Flat River	Settling pond	0.418	1,500	588	B		Spray irrigation installed September 1968	No
Jervis Corporation	Metal finishing	Grandville	Grand River	Chemical treatment of chrome, sedimentation	0.788		20	E			No
Keeler Brass Company	Metal plating	Middleville	Thornapple River	Cyanide reduction, neutralization sludge removal	0.0146	4	2	A		Control adequate	[illegible]
Kroger Company	Warehouse office	Paris Township, Kent County	Plaster Creek	Activated sludge, chlorination	0.01	1.2	51	A	July 26, 1956	Control adequate.	No
LeFere Forge and Machine Company	Truck hubs and gear blanks	Jackson	Grand River	Oil separator	0.265	233	290	B		History of oil losses	No
Leslie Metal Arts Company, Inc.	Metal stamping	Paris Township, Kent County	Plaster Creek	Septic tank and underdrained sand filter, with chlorination	- - No Data Available - -			E	September 29, 1965	To connect to municipal in 1968.	No
Light Metals Corporation	Extrusions	Wyoming	Roy's Creek Drain	Chemical neutralization, sedimentation sludge lagoon	0.54		344		August 26, 1960	Connected to municipal system	No
Michigan Consolidated Gas Company	Gas compressor station	Six Lakes	First Lake at Six Lakes Drain	Cooling water	4.12	No Data Available		A	March 24, 1955	Control adequate	No
Michigan Milk Producers Association	Milk plant	Ovid	Maple River	Spray irrigation	0.5	15	8.87	A	November 29, 1962	Cooling water only to stream	No
Municipal Power Plant	Electric Power	Grand Haven	Grand River	Cooling water pond	0.38	No Data Available		A		Control adequate	No
National Fruit Product, Company, Inc.	Cherry process	Kent City	Ball Creek	Stabilization, ground seepage and irrigation	0.1	No Data Available		A		Seasonal discharge.	No
Nelson Metal Products, Division of Midland-Ross Corporation	Die cast plant	Grandville	Buck Creek	None	- - No Data Available - -			B	July 28, 1966		No
New York Central Railroad		Jackson	Grand River	Oil traps	0.07	No Data Available		A		Control adequate.	No
Ore Ida Foods, Inc.	Fruit and vegetable freezing	Greenville	Dickerson Creek	Primary clarifier, lagoons, spray irrigation	- - No Data Available - -			A	September 23, 1964	Control adequate.	No
Owens-Illinois Glass Company	Glass	Charlotte	Butternut Creek	Sedimentation, oil separation	- - No Data Available - -			B			No
Packaging Corporation of America, American Box Board Division	Corrugated boxes	Grandville	Roy's Creek Drain	None	- - No Data Available - -			B		To connect to municipal system.	No
Packaging Corporation of America, American Box Board Division	Paper cartons	Grand Rapids	Grand River	Save-alls	2.5	3,000	6,500	B		To connect to municipal system in 1968.	No

Company Name	Product	Location	Receiving Stream	Treatment Provided	Discharge Characteristics after Treatment: Flow MGD	5-day BOD lbs/day	Suspended Solids lbs/day	Pollution Status Rating	Date of Order of Determination	Remarks	[illegible]
LOWER PENINSULA CONTINUED											
Pet Milk Company	Condensed milk	Coopersville	Deer Creek	In-plant controls	- - No Data Available - -			A		Only cooling water to stream	No
Pittsburg Forging Company	Forging	Jackson	Grand River	Oil skimmer	0.07	No Data Available		A		Control adequate	No
Ranny Refrigeration	Refrigerators	Greenville	Flat River	Lagoons	0.015	10		B			No
Rockford Paper Mills, Inc.	Box board	Childsdale	Rogue River	Clarifiers	1.0	1,200	4,000	B		Secondary treatment under design	No
Samary Food Products	Fruit processing	Coopersville	Deer Creek	Spray irrigation and screening	0.03	300		A	July 29, 1965	Control adequate	No
Saranac Manufacturing Company	Plating and buffing	Saranac	Grand River	Cyanide and chrome treatment, lagoon	0.150	No Data Available		E	July 29, 1954	Circuit Court Order September 1968. Additional facilities by January 1, 1969	No
Store-A-Way, Inc.	Meat processing	DeWitt	Lookingglass River	In-plant controls	0.001	10	20	A	January 26, 1961	Control adequate	No
Super Food Service	Food warehouse and office	Grand Rapids	Plaster Creek	Activated sludge	0.0008	1.24	3.00	A	November 30, 1961	Control adequate	No
Swanson Pickle Company	Pickle brining	Ravenna	Crockery Creek	Brine lagoon	- - No Data Available - -			B		Lagoons enlarged in 1968	No
Trailmobile	Washing trailers and tank trucks	Wyoming	County drain to Plaster Creek	Grit and grease removal	0.001	No Data Available		A	June 22, 1961	Control adequate	No
Universal Metal Products	Metal products	Saranac	Grand River	None	0.200		35	A		Control adequate	No
White Products Corporation	Water heaters, water softeners and plumbing ware	Middleville	Thornapple River	Cooling water	0.130	20	145	A	October 26, 1961	Control adequate	No
Withrow Pickle Company	Pickles	Sand Lake	Round Lake		- - No Data Available - -			A			No
Wolverine World Wide, Inc.	Shoes, tanning	Rockford	Rogue River	Screening, clarifiers, vacuum filter	0.600	2,000	1,000	D_s	March 26, 1952	To connect to municipal system in 1969.	No
22. Black River Basin											
Bohn Aluminum Corporation	Extrusion aluminum	Holland	Wildwood Drain to Lake Macatawa	Nickel recovery and neutralization, phosphate recovery	0.215	23	50	B	October 25, 1956		No
DeWitt Poultry Processing	Poultry processing	Zeeland	Black River	Septic tank, screening, and sand filters	0.106	3.1	8.0	A		Control adequate.	No
Donnelly Mirrors	Glass mirrors	Holland	Lake Macatawa	Lagoons	0.098	103	294	E_p		Additional treatment under design	No
Hart and Cooley Manufacturing Company	Furnace supplies	Holland	Black River via county drain	Septic tank, stabilization ponds	0.090	34	21	B	April 23, 1952		No
H. J. Heinz and Company	Canning, pickles, vinegar, and cider	Holland	Lake Macatawa	Screening	0.850	2,225	1,000	E_p		Secondary treatment under design	No
Holland Suco Color Company	Organic colors and chemicals	Holland	Lake Macatawa	Clarifier, deep well disposal	0.800	1,700	400	E_{sp}	May 27, 1965		No
Holland Die Casting, Inc.	Zinc castings	Holland	Black River	Neutralization lagoon	0.223	58	48	B	March 25, 1959		No
James DeYoung Generating Station	Electric power	Holland	Lake Macatawa	Cooling water	- - No Data Available - -			B	June 28, 1967		No
Keeler Brass Company	Metal products	Zeeland	Brower Drain	Lagoon and neutralization of acid	0.015	4	2	B_c			No
Meade, Johnson and Company	Drugs	Zeeland	Black River	Activated sludge	0.182	90	197	B_s			No
Miles Laboratories, Inc.	Drugs	Zeeland	Hunter Creek	Lagoon	1.17	107	60	E_s			No
Parke, Davis and Company	Synthetic drugs, chemicals	Holland	Lake Macatawa	Primary settling and Cl_2 oxidation	7.2	144		A	February 24, 1960	Control adequate	No

Company Name	Product	Location	Receiving Stream	Treatment Provided	Discharge Characteristics after Treatment			Pollution Status Rating	Date of Order of Determination	Remarks	Affects Lake Michigan Water Quality
					Flow MGD	5-day BOD lbs/day	Suspended Solids lbs/day				
LOWER PENINSULA CONTINUED											
23. Kalamazoo River Basin											
Albion Malleable Iron Company	Iron castings	Albion	Kalamazoo River	Dust collection, settling	0.780		4,511	E_p		Additional treatment under design.	No
Allegan Metal Finishing Company	Electro-plating	Allegan	Kalamazoo River	Cyanide and metal treatment	0.007	No Data Available		B	March 28, 1963		No
Allied Paper Corporation, Monarch Division	Paper	Kalamazoo	Portage Creek	Clarifier	2.0	400	300		October 24, 1951	Control adequate.	No
Solids								A			
Oxygen demand wastes								A			
Allied Paper Corporation, Bryant Division	Paper	Kalamazoo	Portage Creek	Clarifier	4.0	8,000	7,000			Studies underway for connection to municipal system.	No
Solids								D			
Oxygen demand wastes								E_s			
Allied Paper Corporation, King Division	Paper	Kalamazoo	Kalamazoo River	Clarifier	0.8	900	400		October 24, 1951		No
Solids								A			
Oxygen demand wastes								A			
Aluminum Extrusions, Inc.	Extrudes aluminum	Charlotte	Battle Creek River	Lagoons	- - No Data Available - -			B			No
American Aggregate Corporation	Gravel washing	Kalamazoo	Kalamazoo River	Sedimentation	- - No Data Available - -			A		Control adequate.	No
Brown Paper Company, Mill 1	Parchment and wax paper	Parchment	Kalamazoo River	Lagoon	- - No Data Available - -				October 24, 1951		No
Solids								A			
Oxygen demand wastes								A			
Brown Paper Company, Mill 2	Parchment and wax paper	Parchment	Kalamazoo River	Lagoon	- - No Data Available - -				October 24, 1951		No
Solids								A			
Oxygen demand wastes								A			
Brunswick Corporation	Furniture	Kalamazoo	Allen Creek	Sedimentation, oil separator	0.252		20.9	B	January 21, 1960		No
Chase Manufacturing, Division of Gulf and Western (Scotts, Inc.)	Plating	Douglas	Kalamazoo River	Cyanide and chrome treatment lagoon	0.158	88		B			No
Clark Equipment Company	Fork lift trucks	Battle Creek	Kalamazoo River	Oil removal	- - No Data Available - -			B_s			No
Consumers Power Company	Electric power	Battle Creek	Battle Creek River	Cooling water	- - No Data Available - -			B			No
Consumers Power Company	Electric power	Comstock	Kalamazoo River	Cooling water	- - No Data Available - -			B_s			No
Corning Glass Works	Glass, TV tubes	Albion	Kalamazoo River	Clarifier, neutralization	0.03	No Data Available		A	February 23, 1966	Control adequate.	No
Culligan Soft Water, Inc.	Water softening	Battle Creek	Kalamazoo River	Controlled discharge	0.006	No Data Available		B	September 29, 1956	Restricted to 1000# Cl/day.	No
DeKleine Packing Company	Pickles and relish	Bentheim	Black Creek to Big Rabbit River	Septic tank, screen	- - No Data Available - -			B	June 27, 1957		No
Eaton, Yale and Towne, Inc., Marshall Division	Gears	Marshall	Kalamazoo River	Lagoons	0.144	.20		B		New facilities completed in 1968.	No
General Foods Corporation	Cereal	Battle Creek	Battle Creek River	Cooling water	- - No Data Available - -			B			No
Grand Trunk Railroad Company	Repair of equipment	Battle Creek	Battle Creek River	Oil separator	0.369	No Data Available		B		Additional separator completed in 1968.	No
Kellogg Company	Cereal	Battle Creek	Battle Creek River	Cooling water	- - No Data Available - -			B			No
Lakeside Refining Company	Fuel oil	Kalamazoo	Allen Creek	Oil floatation, skimming, recovery	- - No Data Available - -			A		Control adequate.	No

Company Name	Product	Location	Receiving Stream	Treatment Provided	Discharge Characteristics after Treatment			Pollution Status Rating	Date of Order of Determination	Remarks	[illegible]
					Flow MGD	5-day BOD lbs/day	Suspended Solids lbs/day				
LOWER PENINSULA CONTINUED											
Kalamazoo River Basin Continued											
Lorton Products Company	Rendering, feed and fertilizer	East Saugatuck	Kalamazoo River	Septic tank, settling, irrigation	0.050			A	February 24, 1955	Control adequate	[illegible]
Menasha Corporation, Paper Board Division Solids Oxygen demand wastes	Paper board	Otsego	Kalamazoo River	Save-all, sedimentation, evaporation	0.380	7,300	708	 A B	October 31, 1963		[illegible]
Michigan Fruit Canners, Inc.	Fruit and vegetable canning	Fennville	Mann Creek via county drain	Irrigation	0.500	2,300	403	B		New irrigation system in 1968	[illegible]
Murray Packing Company	Slaughter and packing	Plainwell	Kalamazoo River	Lagoons	0.010	220		E_c	September 29, 1965		[illegible]
New York Airbrake Company Industrial wastes Sanitary sewage	Pumps, motors, valves	Galesburg	Kalamazoo River	Trickling filter, oil floatation and removal	0.192	7.13	5.58	 A A	September 28, 1955	Control adequate.	[illegible]
North American Aluminum Extrusions Corporation	Aluminum tubing and anodizing	Parchment	Travis Creek	Septic tank, neutralization, lagoons	0.7		124	E_{sp}	October 30, 1957		[illegible]
Pet Milk Company	Dairy products	Wayland	Rabbit River	Aeration, filters and irrigation	0.049	145	27	A		Control adequate	[illegible]
Plainwell Canning Company	Canned fruit	Plainwell	Kalamazoo River	Seasonal spray irrigation	0.0436	494		B			[illegible]
Ralston Purina Company	Dog and cat food	Battle Creek	Battle Creek River		- - No Data Available - -					Connected to municipal system	
Shakespeare Corporation	Electro plating	Kalamazoo	Kalamazoo River	Plating recovery system	- - No Data Available - -			A	February 23, 1966	Control adequate	[illegible]
Union Steel Products	Wire products	Albion	Kalamazoo River	Complete treatment for plating waste	- - No Data Available - -			A		Control adequate.	[illegible]
Valley Metal Products Company	Aluminum extrusion	Plainwell	Kalamazoo River	Neutralization, lagoon	- - No Data Available - -					Ceased operations	
Waldorf Paper Products Company, Mac Sim Bar Division Solids Oxygen demand wastes	Paper board	Otsego	Kalamazoo River	Clarifier and stabilization lagoons	1.1	2,035	980	 A B			[illegible]
Weyerhaeuser Company Solids Oxygen demand wastes	Paper	Plainwell	Kalamazoo River	Activated sludge	1.58	295	714	 C B		New treatment plant in 1968	
24. Black River Basin											
Du-well Decorative Compan	Decorative metal	Bangor	Black River	Complete plating waste treatment	0.20		122	A		Control adequate	[illegible]
Michigan Fruit Canners, Inc.	Fruit products	South Haven	Black River	Screening	0.447	2,316	403.4	D		Connection to municipal system [illegible]. Overflows to surface water.	[illegible]
South Haven Chemical Company	Chemicals	South Haven	Black River	Controlled discharge	- - No Data Available - -			A		Control adequate	[illegible]
Paw Paw River Basin											
Burnette Farms Packing Company	Canning vegetables and fruits	Lawrence	Brush Creek	Septic tank and spray irrigation	0.050	300		B			[illegible]
[illegible] Equipment Company	Machinery	Benton Township Berrien County	Ox Creek	Cooling water	0.050	No Data Available		A		Control adequate	[illegible]
Coloma Cooperative Canning Company	Canning	Coloma	Paw Paw River	Screening, irrigation, lagoon	- - No Data Available - -			A			[illegible]
Hartford Metal Protection Company	Chrome plated parts	Hartford	Pine Creek	Complete plating waste treatment	0.071		84.5	B			[illegible]

Company Name	Product	Location	Receiving Stream	Treatment Provided	Discharge Characteristics after Treatment Flow MGD	 5-day BOD lbs/day	 Suspended Solids lbs/day	Pollution Status Rating	Date of Order of Determination	Remarks	Affects Lake Michigan Water Quality
LOWER PENINSULA CONTINUED											
Paw Paw River Basin Continued											
Honee Bear Canning Company	Fruit products	Lawton	Townline Drain	Lagoons	- - No Data Available - -			A	July 28, 1960	Control adequate.	No
Midwest Timer Service, Inc.	Chrome plating	Hager Township Berrien County	Pratt Drain	Chemical precipitation and lagoons	- - No Data Available - -			A	July 28, 1960	Control adequate	No
Millburg Fruit Exchange (Paw Foods)	Canning	Millburg	Blue Creek	Screening, oxidation ponds	- - No Data Available - -			A		Control adequate.	No
Murch, A. F. and Company	Cherry and grape juice	Paw Paw	Jennings Drain	Septic tank, spray irrigation	0.72	300		D	September 21, 1961		No
Pearl Grange Packing Company	Food products	Benton Township, Berrien County	Yore and Stoeffer Drain	Septic tank, lagoon, spray irrigation	0.025	300		A		Control adequate.	No
Pet Milk Company Musselman-Dwan Division	Canning vegetables and fruits	Paw Paw	Paw Paw River	Screening, spray irrigation	0.10	740	335	B			No
Quality Frozen Foods	Food products	Lawrence	Paw Paw River	Screening, lagoon, spray irrigation	- - No Data Available - -			B			No
Sill Farms	Cherry processing	Lawrence	Brush Creek	Screening, spray irrigation	- - No Data Available - -			B			No
Watervliet Paper Company	Paper	Watervliet	Paw Paw River	Save-all	1.75	3,000	12,000	B_s			No
Welch Grape Juice Company	Juices, jams	Lawton	Lawton Creek	Screening, spray irrigation	0.8	1,000		A		Control adequate.	No
26. St. Joseph River Basin											
Alpha, Inc.	Metal plating and tubing	Eau Claire	Extension Drain and other waters	Chemical treatment, lagoon	1.8	88	1,000	B	February 23, 1966	Additional treatment provided in 1968	No
American International Aluminum	Aluminum extrusions	Coldwater	St. Joseph River	Ponds and skimming devices	0.053		29	[illegible]		Additional treatment under design.	No
Bendix Corporation	Gray iron foundry	St. Joseph	Hickory Creek	Cooling water	- - No Data Available - -			A	March 30, 1966	Control adequate	No
Clark Equipment Company	Machinery	Buchanan	McCoy Creek	Oil trap	2.250	75	413	D_s			No
Coldwater Rendering Works	Meat packing	Coldwater	Coldwater Lake	Sedimentation	0.75	131	107	C		New oil separator under study	No
Denton Sleeper Company	Baby Clothes	Centreville	Prairie River	None	0.085	95	178	C_s			No
Eau Claire Packing Company	Canning	Eau Claire	Farmers Creek	Screening, sedimentation lagoon, spray irrigation	0.698	40	30	A		Control adequate.	No
Flam Pickle Company	Pickles	Eau Claire	Love Creek	Septic and settling tanks	0.007	48	7.4	E			No
French Paper Company	Paper manufacturing	Niles	St. Joseph River	Save-all	0.811	2,820	3,620	E_p			No
Industrial Rubber Goods Company	Rubber goods and body trim	St. Joseph	Abraham Drain	Septic tank and Cl_2	- - No Data Available - -			A		Control adequate.	No
Kawneer Company Plant No. 1	Building products	Niles	St. Joseph River	Septic tank, chrome treatment	0.48	125	2,700	D_p	February 25, 1953	Treatment plant under design	No
Kingston Products Corporation, Douglas Manufacturing Division	Electroplating	Bronson	County drain	City and chemical treatment of plating wastes	0.158	100		A	March 21, 1950	Control adequate.	No
Kirsch Manufacturing Company	Metal industry	Sturgis	Fawn River	Oil removal	0.15	4	200	A		Control adequate.	No
Kirsch Manufacturing Company	Metal industry	White Pigeon	White Pigeon Lake	None	0.7	8	204	B_s			No
Lamb Knit Goods	Clothing	Colon	Sturgeon Lake	Septic tank, tile field	- - No Data Available - -			B			No
Michigan Mushroom Company	Mushrooms and asparagus	Niles	St. Joseph River	Vibrating screens	0.025	200		A		Control adequate	No

Company Name	Product	Location	Receiving Stream	Treatment Provided	Discharge Characteristics after Treatment			Pollution Status Rating	Date of Order of Determination	Remarks	Affects Lake Michigan Water Quality
					Flow MGD	5-day BOD lbs/day	Suspended Solids lbs/day				
LOWER PENINSULA CONTINUED											
St. Joseph River Basin Continued											
Midland Wire Corporation	Electrical wire	Three Rivers	St. Joseph River	Cooling water, closed system	- - No Data Available - -			A	January 3, 1964	Control adequate	No
Municipal Power Plant	Electricity	Coldwater	Coldwater River	Cooling tower	- - No Data Available - -			B			No
Quincy Products Company	Refrigeration coils	Quincy	Marble Lake via county drain	Chemical treat-destruction of CN	0.056	50	7.4	B	May 28, 1958	Additional treatment provided in 1968.	No
Research Molding and Film Company		Mendon	St. Joseph River	Oil trap, ponds	0.120	No Data Available		B			No
Rudy Manufacturing Company	Heat exchangers	Dowagiac	Pine Lake Drain	Cooling water to lagoons	0.305	4.1		A	December 3, 1964	New oil separator in 1968	No
Schaefer Manufacturing Company	Electroplating and anodizing	Union City	St. Joseph River	In-plant control	0.08	50		E_s			No
Schmidt Packing Company	Meat packing	Niles	Dowagiac Creek	None	- - No Data Available - -			E			No
Silver Mill Frozen Foods, Inc.	Fruit packing	Eau Claire	Farmers Creek	Lagoons	0.68	500	110	B	January 21, 1966	New irrigation field in 1968	No
Simplicity Pattern Company, Inc.	Paper patterns	Niles	St. Joseph River via Lacey Creek	Save-all units	1.18	1,350	2,360	D_c		Additional save-all units being provided	No
Simpson-Lee Paper Company	Paper	Vicksburg	Gourdneck Creek	Sedimentation with coagulation	4.21	2,306	2,692	E_s	December 5, 1957	Experimental ponds under study	No
Stover Soft Water Service	Recharge water softeners	Berrien Springs	St. Joseph River	Controlled discharge	0.01	No Data Available		A	April 26, 1956	Control adequate.	No
United Foods, Inc.	Canned and frozen food	Sodus	Pipestone Creek via county drain	Screening, irrigation	- - No Data Available - -			B_s			No
Weyerhaeuser Company	Paper	White Pigeon	White Pigeon River	Floatation, save-all, clarifiers	3.628	1,980	3,537	B		Additional clarifier in 1968	No
Whirlpool Corporation	Nickel plating	Benton Harbor	St. Joseph River	Chemical treatment and lagoons	0.144	No Data Available		A	September 23, 1954	Control adequate.	No
Industries with Discharges in Minor Drainage Areas											
Bil-Mar Poultry	Poultry processing	Borcula	Pigeon River	Settling basins, lagoons				D	August 29, 1967	Referred to the Attorney General for enforcement of an Order.	No
Elk Rapids Packing Company	Fruit packing	Lake Leelanau	Lake Leelanay	Screening and chlorination	0.477	832	158	A	June 22, 1961	Control adequate	No
Onekama Canning Company	Canning cherries	Onekama	Portage Lake	Screening				A		Control adequate.	No
Petoskey Plating Company	Auto parts	Petoskey	Bear River	Chemical treatment	0.097			B			No
Smeltzer Packing Company	Cherries and apples	Benzonia	Herring Lake	Screening				A		Control adequate.	No

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Key to Control Status

A - Control adequate
B - Control provided - adequacy not fully established
C - No control--need not established
D - Control provided--protection unreliable
E - Control inadequate
c - construction underway
p - plans being prepared
s - studies underway

APPENDIX H

Public Act 91

STATE OF MICHIGAN

74th LEGISLATURE

REGULAR SESSION OF 1968

Introduced by Reps. Powell, Traxler, Edson V. Root, Jr., Woodman and Stacey, Rep. Rohlfs named as co-sponsor.

ENROLLED HOUSE BILL No. 3683

AN ACT to amend sections 1, 5, 6, 9 and 10 of Act No. 233 of the Public Acts of 1959, entitled as amended "An act to prevent the destruction or damage of agricultural crops, growing plants, livestock or wildlife from the application of any economic poison, pesticide, insecticide, herbicide, fungicide, rodenticide; to provide for the licensing of persons engaged in the business of applying economic poisons out of doors and imposing penalties for violations; to provide for the collection of licensing fees; and to prescribe the powers and duties of certain officers," being sections 286.411, 286.415, 286.416, 286.419 and 286.420 of the Compiled Laws of 1948.

The People of the State of Michigan enact:

Section 1. Sections 1, 5, 6, 9 and 10 of Act No. 233 of the Public Acts of 1959, being sections 286.411, 286.415, 286.416, 286.419 and 286.420 of the Compiled Laws of 1948, are amended to read as follows:

Sec. 1. As used in this act:

(a) "Equipment" means any mechanical device, system, apparatus, or method utilized in the application of economic poisons out of doors.

(b) "Economic poison" means any substance or mixture of substances, by whatever term designated, intended for preventing, destroying, repelling or mitigating any insects, rodents, nematodes, fungi, weeds and other forms of plant or animal life or viruses, except viruses on or in living man or other vertebrate animals, and any substance or mixture of substances intended for use as a plant regulator, defoilant or desiccant, and any other substance intended for such use as may be named by the director of agriculture by rule.

(c) "Insecticide" means a substance or mixture of substances intended for preventing, destroying repelling or mitigating insects.

(d) "Fungicide" means a substance or mixture of substances intended for preventing, destroying, repelling or mitigating fungi.

(e) "Herbicide" means a substance or mixture of substances intended for preventing, destroying, repelling or mitigating weeds.

(f) "Defoliant" means a substance or mixture of substances intended to cause the leaves or foliage to drop from a plant, with or without causing abscission.

(g) "Desiccant" means a substance or mixture of substances intended for artificially accelerating the drying of plant tissue.

(h) "Plant regulator" means a substance or mixture of substances intended through physiological action, for accelerating or retarding the rate of growth or rate of maturation or for otherwise altering the behavior of plants, but does not include substances to the extent that they are intended as plant nutrients, trace elements, nutritional chemicals, plant inoculants and soil amendments.

(i) "Nematocide" means a substance or

mixture of substances intended for preventing, destroying, repelling or mitigating nematodes.

(j) "Insect" means a small invertebrate animal generally having a body more or less obviously segmented, for the most part belonging to the class insecta, comprising 6-legged, usually winged forms, as, for example, beetles, bugs, wasps and flies, and to other allied classes of arthropods whose members are wingless and usually have more than 6 legs, as, for example, spiders, mites, ticks, centipedes and wood lice.

(k) "Fungi" means nonchlorophyll-bearing thallophytes of a lower order than mosses and liverworts as, for example, rusts, smuts, mildews, molds, yeasts and bacteria, except those on or in living man or other animals.

(l) "Weed" means a plant or part thereof which grows where not wanted.

(m) "Nematode" means an invertebrate animal of the phylum nemathelminthes and class nematoda.

(n) "Person" means any individual, firm, partnership, association, corporation, company, joint stock association, or body politic, or any organized group of persons whether incorporated or not; and includes any trustee, receiver, assignee, or other similar representative thereof.

(o) "Aircraft" means a contrivance now known or hereafter invented, used or designed for navigation of, or flight in, the air.

(p) "Ground equipment" means a machine or device other than aircraft, for use on land or water, designed for, or adaptable to, use in applying economic poisons, as sprays, dusts, aerosols, fogs or other forms.

(q) "Director" means the director of agriculture.

Sec. 5. If the director shall find from examination of the application that the applicant is qualified for a license he shall issue such license. The license may restrict the applicant to use of a certain type of equipment or pesticides if the director finds that the applicant is qualified to use only such type. If the license application discloses unsatisfied judgments against the applicant, the director may require a sufficient bond of the applicant conditioned upon the payment of further judgments against him, or the director may refuse to issue a license or annual renewal thereof because of such unsatisfied judgments. The director may refuse to issue a license or annual renewal thereof if the equipment to be used by the licensee is unsafe or inadequate to accomplish the proper application of the economic poisons to be used. The director may refuse to issue a license if the applicant discloses an insufficient knowledge of any item called for in the application. Denial of a license shall be treated as a contested case under the provisions of Act No. 197 of the Public Acts of 1952, as amended, being sections 24.101 to 24.110 of the Compiled Laws of 1948.

Sec. 6. The director may promulgate rules pursuant to the provisions of Act No. 88 of the Public Acts of 1943, as amended, being sections 24.71 to 24.80 of the Compiled Laws of 1948, defining safe and adequate equipment for the application of the several economic poisons; defining wind and weather conditions when certain economic poisons shall not be applied; defining the types of equipment or economic poisons that licensees may use; and defining the method of handling certain economic poisons for the safety of the operator.

F. B. Frost

Sec. 9. There is created an advisory committee on economic posions to consult with and aid the director in the administration of this act. The committee shall be composed of the director of conservation, the director of public health, the director of aeronautics, the director of pesticide research center of Michigan State University and the executive secretary of the water resources commission. Members of the committee may designate an employee to represent them on the committee.

Sec. 10. Any person subject to license under this act who applies economic poisons without such license or who violates an order issued, under this act, is guilty of a misdemeanor.

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Clerk of the House of Representatives

____

Secretary of the Senate

Approved____________________

____

Governor.

INVENTORY OF POTENTIAL SOURCES OF MAJOR SPILLS OF OIL OR OTHER HAZARDOUS MATERIALS

STATE OF MICHIGAN

LOCATION	FACILITY (Owner or Name)	MATERIAL (Type and Source)	MEASURES TO BE TAKEN WHERE NECESSARY TO PREVENT THE ESCAPE OF THE MATERIAL TO THE WATERS
City of Gladstone, Delta County	Marathon Oil Company	Petroleum Products Terminal	Dikes Provided
City of Kipling, Delta County	Thiesen-Clemens	Petroleum Products Terminal	Dikes Provided
City of Escanaba, Delta County	Standard Oil Company	Petroleum Products Terminal	Dikes Provided
	Shell Oil Company	Petroleum Products Terminal	Dikes Provided
City of Rapid River, Delta County	Rapid River Refinery	Petroleum Products Terminal	Dikes Provided
City of Mackinaw City, Cheboygan County	Marathon Oil Company	Petroleum Products Terminal	Dikes Provided
City of Charlevoix, Charlevoix County	Cities Service Oil Company	Petroleum Products Terminal	Dikes Provided
City of Traverse City, Grand Traverse County	Mobil Oil Company	Petroleum Products Terminal	Dikes Provided
City of Muskegon, Muskegon County	Gulf Oil Company	Petroleum Products Terminal	Dikes Provided
	Marathon Oil Company	Petroleum Products Terminal	Dikes Provided
	Standard Oil Company	Petroleum Products Terminal	Dikes Provided
	Naph-Sol Refinery	Petroleum Refinery and Terminal	Dikes Provided
City of Ferrysburg, Ottawa County	Cities Service Oil Company	Petroleum Products Terminal	Dikes Provided
City of St. Joseph, Berrien County	Thiesen-Clemens	Petroleum Products Terminal	Dikes Provided

MONTHLY SUMMARIES
OF
RAW WATER ANALYSES
BENTON HARBOR WATER TREATMENT PLANT
1968

	APR.	MAY	JUNE	JULY	AUG.	SEP.	OCT.	NOV.	DEC.
Protozoa									
Mean	0	0	-	4.5	-	18	36	12	16
Max.	0	0	-	18	-	18	36	72	90
Min.	0	0	-	0	-	18	36	0	0
Chlorophyceae									
Mean	4.5	13	18	13.5	42	90	110	36	30
Max.	18	28	36	36	72	144	234	90	54
Min.	0	0	0	0	18	18	72	0	0
Cyanophyceae									
Mean	34	2	56	72	47	37	100	29	24
Max.	108	9	126	108	81	72	216	90	108
Min.	0	0	18	0	18	27	18	0	0
Diatomaceae									
Mean	1411	1388	1327	759	670	441	960	1233	1136
Max.	1674	1863	1575	972	819	774	1746	1926	1656
Min.	1242	1125	1044	342	504	90	378	396	774
Alkalinity									
Mean	116	111	113	115	114	113	112	115	118
Max.	130	120	117	118	121	128	124	128	137
Min.	107	106	110	109	111	106	105	105	109
Hardness									
Mean	143	134	136	133	130	126	135	140	147
Max.	170	148	154	146	146	150	166	168	180
Min.	130	120	128	124	120	116	124	124	124
Turbidity									
Mean	9	4	4	5	6	4	9	9	16
Max.	24	7	16	6	18	20	51	19	36
Min.	3	2	2	2	3	2	2	4	8

	APR.	MAY	JUNE	JULY	AUG.	SEP.	OCT.	NOV.	DEC.
Color									
Mean	12	6	6	5	4	4	6	8	12
Max.	31	8	24	8	9	13	35	19	25
Min.	4	3	2	2	2	2	3	3	5
Coliforms (MPN)									
Mean	585	239	1466	999	558	1450	405	1689	2795
Max.	2,100	4,600	>11,000	11,000	>11,000	>11,000	2,400	11,000	11,000
Min.	0	0	0	0	0	0	0	0	36
Calcium									
Mean	39.4	38.8	39.5	38.2	36.4	37.2	37.6	38.6	44.6
Max.	47.0	43.0	43.0	43.2	37.6	40.0	43.2	40.0	48.0
Min.	36.0	36.0	36.0	35.2	36.0	35.2	34.4	36.8	40.0
Magnesium									
Mean	9.7	9.4	8.9	9.1	9.7	8.5	10.0	9.7	9.7
Max.	11.2	11.2	10.7	9.7	12.1	9.7	12.1	12.6	13.1
Min.	6.3	6.8	6.8	7.8	8.2	6.3	7.8	6.8	7.2
Chloride									
Mean	10.0	9	9	9	9	10	9.0	10.0	10.0
Max.	13.5	10.5	10.5	10.0	11.0	10.5	10.0	10.5	12.5
Min.	9.0	7.5	9.0	7.5	8.5	8.0	8.5	9.0	9.0
pH									
Mean	8.1	8.2	8.2	8.1	8.3	8.3	8.3	8.2	8.2
Max.	8.2	8.3	8.5	8.5	8.5	8.6	8.6	8.4	8.4
Min.	8.0	7.9	7.9	7.8	8.0	8.1	8.1	7.9	8.1

MONTHLY SUMMARIES
OF
RAW WATER ANALYSES
GRAND RAPIDS WATER TREATMENT PLANT
1968

	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Protozoa									
Mean	35	21	12	45	87	33	17	17	11
Max.	188	92	48	184	232	84	40	100	32
Min.	0	0	0	0	0	0	0	0	0
Chlorophyceae									
Mean	274	129	112	57	50	69	226	69	27
Max.	800	264	184	192	112	194	548	208	60
Min.	92	64	44	12	4	42	126	14	4
Cyanophyceae									
Mean	61	32	114	72	90	87	165	96	55
Max.	208	132	248	172	200	154	328	172	176
Min.	16	0	48	20	16	10	42	16	0
Diatomaceae									
Mean	2,364	1,467	1,507	583	297	93	620	651	809
Max.	3,900	2,088	2,020	1,148	936	178	1,508	980	1,888
Min.	1,384	870	704	276	68	20	68	441	198
Alkalinity									
Mean	111	113	113	112	112	109	108	110	115
Max.	118	123	120	120	118	117	114	115	124
Min.	105	107	107	107	107	105	104	107	108
Hardness									
Mean	136	136	134	132	129	127	127	129	138
Max.	146	148	144	142	136	138	138	144	156
Min.	130	130	128	126	124	122	124	122	126
Turbidity									
Mean	7.9	4.9	3.8	4.3	5.6	4.8	6.6	6.1	11.7
Max.	15.0	7.5	7.2	11.0	11.0	8.7	18.0	10.0	24.0
Min.	4.7	2.5	2.1	2.2	2.4	2.0	2.3	2.1	3.7

	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Color									
Mean	4	4	3.5	3.6	3	3	3	3	4
Max.	6	6	4	4	4	3	4	4	5
Min.	3	3	3	3	3	3	3	2	3
Coliforms (MPN)									
Mean	36	9	130	260	459	206	138	92	118
Max.	460	93	2,400	2,400	2,400	2,400	2,400	460	460
Min.	0	0	0	4	4	3.0	4	4	9
Calcium									
Mean	37.7	35.8	35.4	35.8	34.2	32.6	33.2	34.8	36.1
Max.	40.4	36.8	36.8	36.8	35.2	32.8	34.4	35.2	38.4
Min.	36.0	34.4	34.4	34.4	32.8	32.0	32.8	34.4	34.0
Magnesium									
Mean	10.9	10.6	11.0	11.1	10.8	10.7	10.7	10.7	10.7
Max.	11.6	11.2	11.2	11.7	11.7	11.7	11.2	11.2	11.2
Min.	10.7	10.2	10.7	10.7	10.2	10.2	10.2	10.2	9.8
Chloride									
Mean	9	9	8	9	8	9	9	8	9
Max.	9	9	9	10	9	10	10	9	9
Min.	8	8	8	8	8	8	8	8	8
pH									
Mean	8.3	8.3	8.3	8.2	8.3	8.3	8.3	8.2	8.1
Max.	8.7	8.6	8.6	8.5	8.6	8.7	8.8	8.5	8.4
Min.	8.0	8.2	7.9	7.8	7.8	7.8	8.1	7.9	8.0

CORRECTIONS TO LISTING OF DIRECT INDUSTRIAL DISCHARGES TO LAKE MICHIGAN

1. No. 2 - Change the name of Cherry Growers, Inc. to "Duffy-Mott Corporation."

2. No. 13 - Under abatement action for the Packaging Corporation of America, add "Completion scheduled for June 1, 1972."

CORRECTIONS TO LISTING OF INDUSTRIAL SURFACE WATER DISCHARGES IN THE LAKE MICHIGAN BASIN

1968

1. First item under Menominee River Basin - Under remarks for the American Can Company, Menominee Mill, delete "being installed" and add "completed October 1, 1968."

2. Item under Escanaba River Basin - Under remarks for the Mead Corporation, Escanaba Division, add "Completion scheduled for June 1, 1972."

3. Fourth item under Manistee River Basin - Under remarks for the Packaging Corporation of America,

add "Completion scheduled for June 1, 1972."

4. Sixth item under Grand River Basin - Under remarks for Aunt Jane's Foods, Division of the Borden Company, add "Completion scheduled for May 1, 1969."

5. Forty-second item under Grand River Basin - Under remarks for the Packaging Corporation of America, American Box Board Division, change the year 1968 to "1969."

6. Forty-sixth item under Grand River Basin - Under remarks for Rockford Paper Mills, Inc., add "Completion scheduled for 1969."

7. Third item under Black River Basin - Under remarks for Donnelly Mirrors, add "Completion scheduled for 1969."

8. First item under Kalamazoo River Basin - Under remarks for the Albion Malleable Iron Company, add "Completion scheduled for 1969."

9. Fourth item under Kalamazoo River Basin - Under remarks for the Allied Paper Corporation, Bryant Division, delete "Studies under way for connection to municipal system" and add "De-ink wastes to be connected to the municipal system by September 1, 1969."

F. B. Frost

10. Twenty-eighth item under Kalamazoo River Basin - Under remarks for the North American Aluminum Extrusions Corporation, add "Additional treatment completed February 1, 1969."

11. Second item under St. Joseph River Basin - Change the name of American International Aluminum to "Essex Wire Corporation." Also, under remarks, add "Completion scheduled for 1969."

12. Twenty-sixth item under St. Joseph River Basin - Under remarks for the Simpson-Lee Paper Company, delete "Experimental ponds under study" and add "Secondary treatment under design."

13. First item under Industries with Discharges in Minor Drainage Areas - Change the name of Bil-Mar Poultry to "Bil-Mar Foods, Inc." Also, under remarks, delete "Referred to the Attorney General for enforcement of an Order" and add "Additional treatment completed in 1968."

F. B. Frost

CORRECTIONS TO
MICHIGAN'S MUNICIPAL WASTEWATER
DISCHARGE INVENTORY
LAKE MICHIGAN BASIN

Under "Status and Abatement Action," the following municipalities have indicated their intention to proceed on a voluntary program. Stipulations are now being developed.

MENOMINEE RIVER BASIN

Iron Mountain-Kingsford

DAYS RIVER BASIN

Gladstone

MANISTIQUE RIVER BASIN

Manistique

MUSKEGON RIVER BASIN

Cadillac
Fremont
Muskegon
Muskegon Heights
North Muskegon
Reed City

GRAND RIVER BASIN

Delta Township
East Lansing
Grand Haven
Grand Rapids
Grandville
Greenville
Hastings
Ionia
Lansing
Mason
Wyoming

BLACK RIVER BASIN (HOLLAND)

Holland

Zeeland

KALAMAZOO RIVER BASIN

Albion

Charlotte

Marshall

Otsego

Plainwell

ST. JOSEPH RIVER BASIN

Benton Harbor and St. Joseph

Berrien Springs

Bronson

Buchanan

Dowagiac

Hillsdale

MISCELLANEOUS DRAINAGE AREAS

Escanaba

Harbor Pointe

CORRECTIONS TO
MICHIGAN'S MUNICIPAL WASTEWATER
DISCHARGE INVENTORY
LAKE MICHIGAN BASIN

1. Fifth item under "Menominee" - Under heading containing dates for Iron Mountain-Kingsford, make the following changes:

a. Plans Approved - delete "9-1-70" and add "2-1-71."

b. Start Construction - delete "6-1-71" and add "5-1-71."

c. Complete - delete "12-1-72"

and add "10-1-72."

2. Seventh item under "Menominee" - Make the following changes for Menominee:

a. Status and Abatement Action - delete "to be developed by January 1, 1969," and add "effective February 14, 1969."

b. Plans Approved - delete "9-1-70" and add "12-1-70."

3. Ninth item under "Menominee" - Make the following change for Norway:

a. Treatment Provided - delete "None" and add "Secondary, AS."

4. First item under "Days" - Make the following changes for Gladstone:

a. Plans Approved - delete "9-1-70" and add "12-1-70."

b. Start Construction - delete "6-1-71" and add "5-1-71."

c. Complete - delete "12-1-72" and add "6-1-72."

5. Second item under "Pine" - Make the following changes for Charlevoix:

a. Status and Abatement Action - delete "Statutory proceedings to be initiated by January 1, 1969" and add "Stipulation effective February 14, 1969."

b. Plans Approved - delete "3-1-71" and add "9-1-70."

c. Start Construction - delete "12-1-71" and add "6-1-71."

6. First item under "Manistee" - Make the following changes for Manistee:

a. Status and Abatement Action - add "Stipulation effective February 14, 1969."

b. Plans Approved - delete "3-1-71" and add "9-1-70."

c. Start Construction - delete "12-1-71" and add "6-1-71."

7. Second item under "White" - Make the following changes for Whitehall:

a. Status and Abatement Action - delete "to be developed by January 1, 1969" and add "effective October 1, 1968."

b. Plans Approved - delete "9-1-70"

and add "3-1-71."

c. Start Construction - delete "6-1-71" and add "8-1-71."

d. Complete - delete "12-1-72" and add "10-1-72."

8. Seventh item under "Grand" - Make the following changes for Carson City:

a. Treatment Provided - delete "None" and add "Secondary, L."

b. Complete - add "Completed 1968."

9. Eleventh item under "Grand" - Make the following change for Delhi Township:

a. Status and Abatement Action - delete "to be" and "By January 1, 1969" and add "February 1969."

10. Eighteenth item under "Grand" - Make the following change for Eaton Rapids:

a. Status and Abatement Action - delete "to be" and "By January 1, 1969" and add "February 1969."

11. Twenty-first item under "Grand" - Make the following changes for Gaines Township (Cutlerville):

F. B. Frost

a. Status and Abatement Action - delete "ing" on the word connecting.

b. Start Construction - delete "under construction."

C. Complete - add "1968."

12. Thirty-second item under "Grand" - Make the following additions to Jackson:

a. Plans Approved - "3-1-69."

b. Start Construction - "7-1-69."

c. Complete - "10-1-70."

13. Thirty-sixth item under "Grand" - Make the following additions to Lake Odessa:

a. Plans Approved - "2-1-69."

b. Start Construction - "5-1-69."

c. Complete - "6-1-70."

14. Forty-ninth item under "Grand" - Make the following changes to Paris Township (now City of Kentwood):

a. Status and Abatement Action - delete "ing" on the word constructing and add "ed."

b. Start Construction - delete

"under construction."

c. Complete - add "1968."

15. Fifty-fifth item under "Grand" - Make the following changes to Portland:

a. Status and Abatement Action - delete "to be" and "By January 1, 1969" and add "February 1969."

b. Plans - add "9-1-70".

c. Start Construction - add "6-1-71."

16. Fifty-eighth item under "Grand" - Make the following additions to St. Johns:

a. Plans - "3-1-71."

b. Start Construction - "12-1-71."

17. Sixtieth item under "Grand" - Make the following changes for Sparta:

a. Status and Abatement Action - delete "Stipulation to be developed by January 1, 1969" and add "Voluntary Program."

b. Start Construction - add "Construction started January 21, 1969."

c. Complete - delete "12-1-72" and add "8-1-70."

18. Sixty-first item under "Grand" - Make the following additions to Spring Lake:

a. Plans - "9-1-70."

c. Start Construction - "6-1-71."

19. Sixty-third item under "Grand" - Make the following additions to State Prison of Southern Michigan (Jackson):

a. Plans - "3-1-71."

b. Start Construction - "12-1-71."

c. Complete - "12-1-72."

20. Sixty-fifth item under "Grand" - Make the following change to Walker:

a. Start Construction - delete "under construction" (project was completed 12-31-68).

21. Last item under "Grand" - Make the following change to Wyoming:

a. Start Construction - delete "12-1-71" and add "7-1-71."

22. Fourth item under "Kalamazoo" - Make the following changes to Bellevue:

a. Status and Abatement Action -

F. B. Frost

delete "Final Order Adopted December 15, 1966" and add "Circuit Court Order."

b. Start Construction - add "5-1-69."

c. Complete - add "11-1-69."

23. Eleventh item under "Kalamazoo"- Make the following changes for Kalamazoo:

a. Status and Abatement Action - delete "to be developed by January 1, 1969" and add "effective February 14, 1969."

b. Plans - delete "3-1-71" and add "9-1-70."

c. Start Construction - delete "12-1-71" and add "6-1-71."

24. Last item under "Black (South Haven)" - Make the following additions to South Haven:

a. Plans - "9-1-70."

b. Start Construction - "6-1-71."

25. Third item under "Paw Paw" - Make the following addition to Hartford:

a. Status and Abatement Action - "Statutory proceedings initiated February 1969."

26. Sixth item under "Paw Paw" - Make the

following changes to Paw Paw:

a. Status and Abatement Action - delete "to be" and "By January 1, 1969" and add "February 1969."

b. Plans - add "9-1-70."

c. Start Construction - add "6-1-71."

d. Complete - add "12-1-72."

27. Ninth item under "St. Joseph (Mich.)" Make the following change to Coldwater:

a. Status and Abatement Action - delete "to be" and "by January 1, 1969" and add "February 1969."

28. Eighteenth item under "St. Joseph (Mich.)" - Make the following additions to Niles:

a. Plans - "12-1-70."

b. Start Construction - "6-1-71."

29. Twenty-second item under "St. Joseph (Mich.)" - Make the following additions to Sturgis:

a. Plans - "9-1-70."

b. Start Construction - "6-1-71."

30. Twenty-third item under "St. Joseph (Mich.)" - Make the following additions to Three Rivers:

a. Plans - "6-1-69."

b. Start Construction - "9-1-70."

31. Last item under "St. Joseph (Mich.)" - Make the following changes to Vicksburg:

a. Status and Abatement Action - delete "Statutory proceedings to be initiated by January 1, 1969" and add "Stipulation effective February 1969."

b. Plans - add "9-1-70."

c. Start Construction - add "6-1-71."

32. Second item under "Miscellaneous Drainage Areas" - Make the following changes to Chikaming Township (Sawyer, Lakeside, Union Pier):

a. Plans - delete "12-1-68."

b. Start Construction - delete "10-1-69" and add "4-1-70."

c. Complete - delete "10-1-70" and add "4-1-71"

33. Third item under "Miscellaneous Drainage Areas - Make the following changes to Escanaba:

a. Plans - delete "3-1-71" and add "9-1-70."

b. Start Construction - delete "12-1-71" and add "6-1-71."

34. Eighth item under "Miscellaneous Drainage Areas" - Make the following changes to New Buffalo:

a. Status and Abatement Action - delete "to be" and "by January 1, 1969" and add "February 1969."

b. Plans - add "9-1-70."

c. Start Construction - add "6-1-71."

35. Ninth item under "Miscellaneous Drainage Areas" - Make the following changes to New Buffalo Township (Union Pier area):

a. Plans - delete "12-1-68."

b. Start Construction - delete "10-1-69" and add "4-1-70."

c. Complete - delete "10-1-70" and add "4-1-71."

36. Eleventh item under "Miscellaneous Drainage Areas" - Make the following additions to Petoskey:

a. Plans - "12-1-70."

b. Start Construction - "6-1-71."

F. B. Frost

37. Last item under "Miscellaneous Drainage Areas" - Make the following additions to Wequetonsing:

a. Plans - "3-1-71."

b. Start Construction - "12-1-71."

PROPOSED ACT

(or Rules and Regulations)

FOR THE DISPOSAL OF SEWAGE FROM MARINE TOILETS

Developed by Subcommittee on "Wastes from Watercraft" - Lake Michigan - Four State Enforcement Conference. Approved by All Conferees, March 2, 1968.

* * *

AN ACT (or Rules and Regulations) to regulate the disposal of sewage from watercraft.

1.0 DEFINITIONS

For purposes of this Act (or Rules and Regulations), unless the context clearly requires a different meaning:

1.1 "Watercraft" includes every description of watercraft, other than a seaplane, on the water, used or capable of being used as a means of transportation on water, except vessels engaged in Interstate Commerce and vessels of foreign registry.

1.2 "Sewage" means all human body wastes.

1.3 "Litter" means bottles, glass, crockery, cans, scrap metal, junk, paper, garbage, rubbish, plastic, or similar refuse discarded as no longer useful or useable (or use definition in own State boating law).

1.4 "Marine Toilet" means any toilet on or within any watercraft.

1.5 "Waters of the State" means all of the waterways on which watercraft shall be used or operated (or State definition).

1.6 "Person" means an individual, partnership, firm, corporation, association, or other entity (or State definition).

1.7 "Owner" means the person who has lawful possession of a boat by virtue of legal title or equitable interest therein which entitles him to such possession (or State definition).

1.8 "Department" means the...(name of the State agency which shall administer this Act).

2.0 LITTERING OR POLLUTING WATER - RESTRICTIONS

Restrictions on placing, throwing, depositing or discharging litter into waters of this State are contained in...(refer to appropriate State act or rules and regulations).

3.0 MARINE TOILETS - RESTRICTIONS

3.1 No marine toilet on any watercraft used or operated upon waters of this State shall be operated so as to discharge sewage into said waters, directly or indirectly, unless the sewage has been rendered nonpollutional by passage through a device approved by the Department (or...name of State water pollution control agency if Department and said agency are not the same).

3.2 No person owning or operating a watercraft with a marine toilet shall use, or permit the use of, such toilet on the waters of this State, unless the toilet is equipped with facilities that will treat, hold, incinerate or otherwise handle sewage in a manner capable of preventing water pollution.

3.3. No person shall dispose of sewage, accumulated in a holding tank or any other container on a watercraft, in such manner that the sewage reaches or may reach the waters of this State, except through a sewage disposal facility approved by the Department (or...name of State water pollution control agency if Department and said agency are not the same).

4.0 MARINE TOILETS - POLLUTION CONTROL DEVICES

4.1 After the effective date of this Act, every marine toilet on watercraft used or operated upon waters of this State shall be equipped with a pollution control device in operating condition approved by the Department (or...name of State water pollution control agency if Department and said agency are not the same).

4.2 Pollution control devices that

are acceptable for purposes of this Act are:

4.21 Holding tanks which retain toilet wastes for proper disposal pursuant to Rule 3.3.

4.22 Incinerating devices which will reduce to ash all sewage and toilet wastes produced on the watercraft. Ash is to be disposed of on shore, not to waters of the State.

4.23 Any other device determined by the Department (or agency) to be effective in preventing pollution from marine toilets.

5.0 ENFORCEMENT

(Refer to enforcement authority of State Boating Act). (Or Pollution Control Act).

6.0 EFFECTIVE DATE

The provisions of this Act with reference to requiring watercraft with toilet facilities to be equipped with pollution control devices shall take effect January 1, 1970.

- - -

MR. STEIN: Before we have comments or questions, I would like to do two things. One, I neglected to introduce Mr. John Egan, of the Chicago Sanitary District, who is here with us on the panel.

And I would like to go off the record for a second.

(Off the record.)

MR. STEIN: Are there any comments or questions on the Michigan statement?

If not, thank you very much.

MR. POSTON: I would comment very briefly that Mr. Frost has given a very complete report here, and I think he is to be commended for listing all of these communities and going down recommendation by recommendation with the activities that the State has taken in response to these specific recommendations of the Conferees.

MR. STEIN: I would say in respect to all the recommendations that as far as I can see that the State is on schedule and moving ahead with the program.

And I think, Mr. Purdy and Mr. Frost, this has been an excellent report and thank you.

May we have Illinois?

MR. PURDY: Mr. Chairman, I have a request from the Grand River Watershed Council to make a statement, Mr. John Kennaugh.

MR. STEIN: Yes, that will be all right.

STATEMENT BY JOHN H. KENNAUGH
EXECUTIVE SECRETARY, MICHIGAN
GRAND RIVER WATERSHED COUNCIL,
LANSING, MICHIGAN

MR. KENNAUGH: Mr. Poston, Mr. Chairman, Conferees, and ladies and gentlemen.

In recognition of your request to make this a short affair at this time, I will refrain from reading our whole report. I believe that you do have this before you.

I would like to comment, though, that we did present a paper last year at your first Conference in which we stated that it is our purpose to dedicate the support of the Watershed Council to local, State and Federal agencies to abate pollution in our streams, lakes and Lake Michigan.

Our Council is a council made up of representatives from 81 eligible units of government in our basin, where we are actively representing 55 of these governmental units on a voluntary basis, and out of this voluntary participation we are exercising conservation through cooperation.

Since last year we have implemented three very effective programs leading toward the abatement of pollution in our streams. One of these programs, as you will note in the report, was the soil erosion guidelines that are being developed by a technical advisory committee of our Council. We recognize that one of the major pollution problems of our State has to do with the matter of soil erosion from urbanized areas, not only soil erosion from our rural areas but also from the urbanized metropolitan and smaller communities in our basin.

A second program that we have implemented in our State is the matter of flood plain control. We realize that in order to provide effective control measures in the development of flood plain areas we need to have technical studies, such as hydrologic studies and soil surveys in order for local communities to adopt enforceable regulations to support health ordinances, subdivision control ordinances and building codes.

Another very important program of our Council is in the area of the Type II comprehensive water resources planning study that is being conducted by the Federal Government. Our Council is bridging the gap between Federal planning and the development of local resources, where we are representing the grass roots of our communities in the development of a plan that is being developed, prepared by the Grand River Basin Coordinating Committee.

One of the most important programs of our Council that was adopted in 1968 is the stream monitoring control program that is participated in by 13 governmental units in our basin on a voluntary and a cooperative basis. This is important for us in order to be able to evaluate the changing characteristics of our streams in order for us to develop proper controls and measures for the preservation and proper utilization of our streams.

I have only cited these programs in

title and the general description rather than read the report. I would like to read the closing remarks of the report.

"The Watershed Council is composed of the grass roots elements of our communities and provides them the opportunity to become involved in the planning aspects of a water management program and continue their involvement by carrying out the program. This involvement allows direct and personal relationships with State and Federal officials in the development of regional water management programs.

"The Michigan Grand River Watershed Council recognizes the need for a united effort to preserve our water resources. The program of the Watershed Council has exemplified its concern and demonstrated its ability to involve the people in sharing in the responsibilities for preserving these resources. The Michigan Grand River Watershed Council again dedicates its support to local, State and Federal agencies to abate pollution in our streams, lakes and Lake Michigan."

Thank you.

(The following is the document submitted by Mr. Kennaugh:)

THE ROLE OF MICHIGAN COMMUNITIES
TO COMBAT
THE WATER POLLUTION PROBLEM

Presented At The
LAKE MICHIGAN POLLUTION CONFERENCE
Sherman House, Chicago, Illinois
February 25, 1969
Conference Chairman
The Honorable Murray Stein

MICHIGAN GRAND RIVER WATERSHED COUNCIL
609 Prudden Building - Lansing, Michigan 48933
Frank W. Bouma
Chairman
John H. Kennaugh
Executive Secretary

THE ROLE OF MICHIGAN COMMUNITIES
TO COMBAT
THE WATER POLLUTION PROBLEM

The Michigan Grand River Watershed Council reported to the Lake Michigan Pollution Conference in 1968, and stated,

> "it dedicates its support to local, State and Federal agencies to abate pollution in our streams, lakes and Lake Michigan."

The purpose of this report is to demonstrate how local communities including counties, cities, villages and townships have worked together to preserve their water resources.

CONSERVATION THROUGH COOPERATION

The Grand River Basin is the second largest basin in the State of Michigan covering an area over 5,570 square miles. There are approximately one million people living in the area, governed by a multiplicity of governmental units including 13 counties, 29 cities, 43 villages and 158 townships. From the 81 governmental units eligible to be members of the Watershed Council, 55 are voluntarily participating to develop programs that will benefit all the communities in the basin. Through the effort of these communities, the purpose of the "Local River Management Act" is being fulfilled,

> "to enable local units of government

> to cooperate in planning and carrying out
> a coordinated water management program in
> the watershed which they share."

The effectiveness of an organization is recognized by the vitality of its members to develop action programs. Action is the result of planning and implementation. The Watershed Council,through the guidance of its Executive Committee and subcommitties, has been actively involved leading to action programs.

SOIL EROSION GUIDELINES

One of the major pollution problems of the Grand River and its tributaries is sedimentation from soil erosion, resulting from poor management practices of land during periods of development, improper land use and uncontrolled runoff. A Technical Advisory Committee has been created by the Watershed Council composed of representatives from the Watershed Council, Soil Conservation Service, local and regional planning commissions, county and State highway departments, and the Water Resources Commission to develop guidelines to demonstrate proper management practices for abating soil erosion in rural and urbanizing areas. The guidelines will be available to property owners, developers and governmental units to be used for the protection of our lakes and streams.

An effective sediment control program involves certain basic principles; sediment control in the urban areas should become a stated policy of all local governmental units and all concerned public agencies; a public information education program on sediment control is necessary to obtain public and private support; competent technical personnel, workable procedures, regulations, and enforcement are essential for successful sediment control; and sediment control provisions should be incorporated in the planning stage for the most effective application of soil erosion control measures during the construction stage of development.

The role of the Watershed Council will be to encourage all governmental units in the Grand River Basin to support the basic principals of a sediment control program and to assist them in developing effective local soil erosion controls.

J. H. Kennaugh

FLOOD PLAIN CONTROLS

Urbanization around the large and small communities, and the increased need for additional agricultural lands have emphasized the need for establishing effective controls on the flood plains of the Grand River Basin. Flood plain controls are essential; to protect the streams from substandard sanitary systems; to protect properties against unnecessary damages caused by flooding; and to effectively develop the flood plain areas to provide maximum benefit for the public.

The Watershed Council filed applications for Flood Plain Information Studies on behalf of seventeen governmental units in the basin. Upon completion of these studies, the communities will have technical data available to support enforcement of health ordinances, zoning ordinances, subdivision control ordinances and building codes.

TYPE II COMPREHENSIVE WATER RESOURCES PLANNING STUDY

The Grand River Basin was one of sixteen basins in the Nation designated by Congress to have a Type II Study. Following the organization of the Michigan Grand River Watershed Council in 1966, Governor George

Romney authorized the Council to advise and consult the State of Michigan in the development of the Study on behalf of the local governmental units.

Representatives of the Watershed Council have actively participated with the Grand River Basin Coordinating Committee and on the Basin Plain Formulation Committee. The Watershed Council has been authorized to conduct an intensive informational program to present the suggested plan to the governmental units and the public. Through the services of the Watershed Council the people will have sufficient opportunity to review the suggested plan and offer comments prior to the drafting of the final report.

STREAM MONITORING CONTROL PROGRAM

A major emphasis of the Watershed Council has been the implementation of a systematic stream monitoring program. In June of 1968 the following communities have participated in this endeavor.

Grand Haven
Coopersville
Grandville
Grand Rapids
Lowell
Ionia
Portland
Grand Ledge

J. H. Kennaugh

Lansing	Jackson
East Lansing	Hastings
Eaton Rapids	

The basic parameters tested monthly by the wasted water treatment plant technicians at 76 stations include temperature, dissolved oxygen, biochemical oxygen demand, pH and total coliforms. In addition to the monthly program, the basic parameters and the following additional parameters are tested by one or more of the metropolitan cities; chlorides, total phosphate, ortho phosphate, total soluble phosphate, total chromium, cyanide, nickel, ammonia nitrogen, nitrate nitrogen, copper, zinc and suspended solids.

All data is being stored by the Watershed Council in the Storet computer sponsored under the auspices of the Federal Water Pollution Control Administration. Through the computerized retrieval program of the Storet the Watershed Council will be able to analyze and submit periodic reports on the quality characteristics of the streams. Consideration will also be given to programs that may be needed to preserve and enhance the water quality of our streams and lake.

* * *

The Watershed Council is composed of the grass-roots elements of our communities and provides them the opportunity to become involved in the planning aspects of a water management program and continue their involvement by carrying out the program. This involvement allows direct and personal relationships with State and Federal officials in the development of regional water management programs.

The Michigan Grand River Watershed Council recognizes the need for a united effort to preserve our water resources. The program of the Watershed Council has exemplified its concern and demonstrated its ability to involve the people in sharing in the responsibilities for preserving these resources. The Michigan Grand River Watershed Council again dedicates its support to local, State and Federal agencies to abate pollution in our streams, lakes and Lake Michigan.

MR. STEIN: Thank you, Mr. Kennaugh. Are there any comments or questions?

If not, thank you for your contribution.

It is groups like yours, of course, that are the backbone of water development in this country.

Mr. Purdy, are we set?

MR. PURDY: All set.

MR. STEIN: You know, we have really a line of distinction with Grand River, because the distinguished Conferee on my right, Mr. Klassen, was born in the Grand River basin.

May we hear from Indiana?

MR. POOLE: Mr. Chairman, Perry Miller will present for Indiana.

STATEMENT BY PERRY E. MILLER
DIRECTOR OF THE BUREAU OF
ENGINEERING, INDIANA STATE BOARD OF HEALTH,
INDIANAPOLIS, INDIANA

MR. MILLER: Mr. Chairman, Conferees.

My name is Perry Miller. I am Director of the Bureau of Engineering of the Indiana State Board of Health, making this statement on behalf of the Indiana Stream Pollution Control Board.

Mr. Chairman, I do not intend to read the report in its entirety, and will summarize the first part of it and ask that it be included in the record as though read.

MR. STEIN: Without objection, it will be included in the record as if read.

MR. MILLER: There are a number of municipalities in this basin that are or have submitted plans to the Stream Pollution Control Board. The total cost of the construction of these plants is 18 million dollars. The total of the Federal grant request is 5.4 million dollars. This exceeds the total amount of the Federal grant money available to the State of Indiana and we are encountering extreme resistance from municipalities relative to starting projects without Federal grant funds. We think that it is important that the Federal grants be funded in their authorized amounts.

Semi-Publics. We are continuing to connect semi-public plants to municipal sewer systems, and in the Merrillville Conservancy District five such subdivisions have been connected to the system and are now going to the Gary Sanitary District plant for treatment.

P. E. Miller

Since the start of this Conference 15 projects at 13 industries have been completed and there are 18 projects under construction at this time and 9 additional industries are proceeding with the preparation of plans and specifications.

With this, I would like to move over to page 5 in the report, which then gives the status of the work as compared with the numbered recommendations in the report of the Conference.

Under Recommendation No. 1:

Municipalities have been advised of the requirement for at least 80 percent reduction of total phosphorus. Plans for new wastewater treatment plants or major improvements to existing plants are not approved by the Board unless facilities for phosphorus removal are included or approval is conditioned on the provision of such facilities. Portage and Elkhart have included plans for phosphorus removal in planned sewage works projects. East Chicago's research project for advanced waste treatment includes studies of phosphorus removal, and Gary has retained consulting engineers for recommendations for plant improvements including advanced waste treatment and phosphorus removal. The requirement for phosphorus removal places a burden on small municipalities, and it is likely that operation of these facilities will be a problem in the smaller towns. It is recommended that the States determine where phosphorus removal is required as long as 80 percent reduction of municipal and industrial sources is obtained within the drainage basin of the respective State.

2. Indiana industries listed in the implementation plans of the Water Quality Standards are scheduled to provide adequate treatment substantially before December 1972.

3. Lists of Indiana municipalities and industries discharging wastewater to the Lake Michigan basin were submitted to the Conferees on October 30, 1968. Copies of the lists, which have been updated to reflect current conditions, are appended.

4. All municipalities in Lake, LaPorte and Porter Counties with effluent discharge to the basin have effluent chlorination facilities and have been advised of the requirement for continuous disinfection throughout the year. Compliance is anticipated not later

than May 1969.

Municipalities in the St. Joseph River drainage basin have been advised of the requirement; however, some municipalities do not have adequate effluent chlorination facilities in operation or under construction. The City of South Bend is under order of the Stream Pollution Control Board to provide effluent chlorination. The city has appealed the Board's order and the case is pending in the Starke County Circuit Court. Ligonier and South Bend have submitted final plans for major improvements including effluent chlorination, and LaGrange has submitted final plans for effluent chlorination; however, none of these municipalities is proceeding to construction. All of these communities have filed applications for Federal grants under PL 660; however, they have not been certified for priorities because sufficient Federal funds are not available to reach these municipalities. Goshen has facilities for effluent chlorination; however, adequate contact time is not provided. Consideration is being given to addition of a contact tank. Ashley does not have facilities. These municipalities will not meet the May 1969 date.

P. E. Miller

5. Unified collection systems serving contiguous areas are encouraged. In accordance with a recommendation of the Stream Pollution Control Board, the City of East Gary signed an agreement with the Gary Sanitary District for connection of its sewage collection system to the Gary system rather than providing a separate treatment facility, and the Town of Porter is completing a connection to the Chesterton sewage treatment plant.

6. Detailed information has not been obtained on the extent of the problem relative to the requirement for adjustable overflow regulating devices. Gary has increased the interception of flow above dry weather flow on an average of approximately 10 mgd; in addition, consulting engineers have been retained to prepare a master plan for sewer improvements. This program will receive increased attention in the near future.

7. The Stream Pollution Control Board at a meeting on June 5, 1967, adopted the policy "that sewer construction within a redevelopment area must provide separate stormwater and sanitary waste systems in order to begin a sewer separation in the drainage area

even though the stormwater, after separation, would discharge to an existing combined sewer." It has also been the policy of the Board for some time not to approve combined sewers in new developments. It is anticipated that major pollution from combined sewer overflows will be controlled by July 1977. The City of East Chicago has submitted plans for extensive sewer separation to serve a large urban renewal area and adjacent areas and for a demonstration project, partially financed by a FWPCA grant, to treat combined sewer overflows from another major area. South Bend and Mishawaka have also undertaken sewer separation in urban renewal areas.

8. Discharge of industrial wastes amenable to treatment to municipal sewers is encouraged. Where pretreatment is advisable, it is required.

9. Industrial effluents that include sanitary sewage or suspected of containing pathogenic organisms are being evaluated to determine if there is a deleterious effect on receiving waters.

11. The Corps of Engineers has submitted reports recommending several sites in Indiana for disposal of dredged material from Indiana Harbor and Michigan City

Harbor, Indiana. When sites have been tentatively selected, they will be surveyed relative to pollution hazards and problems that might arise from sites located in flood plains.

12. The Department of Interior and the four States each pledged $250,000 to finance a program to collect the anticipated 1968 die-off of alewives and transport them to onshore disposal sites. Indiana arranged for Bethlehem Steel Corporation to receive the alewives netted adjacent to Indiana and bury them under a sand fill in Bethlehem's riparian landfill at Burns Harbor. Although the die-off was very light, sufficient fish were obtained to test the collection and disposal setup. Some of the collection and disposal problems have been resolved and it is anticipated that if a significant die-off is predicted in the future, a similar program could be undertaken if adequate financing is made available.

13. In connection with the watercraft, there was a bill introduced in the Indiana General Assembly. This bill has passed the Senate and the House and now is awaiting the Governor's signature. The effective date of this bill is January 1971.

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14. In addition to the situations mentioned in Item 5, other contiguous urbanized areas are encouraged to use area-wide sewage facilities. The Merrillville Conservancy District in Lake County is serving 2,463 homes. This includes the sewage from five subdivisions that formerly operated small sewage treatment plants and many homes that were served by septic tank absorption systems. A new sanitary sewer system to serve the Independence Hill Conservancy District will also connect to Merrillville Conservancy District sewers. A private utility north and east of South Bend is serving homes and commercial facilities adjacent to U. S. 31 that formerly were served by small treatment plants and septic tank absorption systems. Sewage and wastes from the utility sewer system are discharged to the South Bend sewage treatment plant.

17. The committee appointed to develop--this is on the monitoring, and I will skip that one at this time. The report has not been made.

18. The inventory of sites where potential exists for major spills of oil and other hazardous material was submitted to the Conferees on October 30, 1968.

Copies of the lists, Appendix IV, V and VI, are appended.

19. This again is on a report that is to be submitted, but I am going to read this one anyway.

19. The monitor committee report recommends a list of uniform water quality analyses to be performed at the selected water filtration plants with water intakes in Lake Michigan. It is recommended that monthly analyses include those recommended for open water sampling stations. Indiana will complete the analyses that cannot be accomplished by the Gary and Michigan City water filtration plant laboratories.

21. The Indiana Water Quality Standards require that the effluents from municipal and industrial wastewater treatment plants be substantially free of visible oil.

This concludes the Indiana report, Mr. Chairman.

(The following is the document submitted by Mr. Miller:)

P. E. Miller

PROGRESS REPORT
FOR
CONFERENCE
ON
POLLUTION OF LAKE MICHIGAN AND ITS TRIBUTARY BASIN
(WISCONSIN - ILLINOIS - INDIANA - MICHIGAN)

RECONVENED FEBRUARY 25, 1969
CHICAGO, ILLINOIS
ON BEHALF OF
THE
INDIANA STREAM POLLUTION CONTROL BOARD
AND
THE STATE OF INDIANA
FEBRUARY 1969

Introduction

The January 1968 report prepared for the Conference on Pollution of Lake Michigan and its Tributary Basin provided a description of the Indiana portion of the basin, a summary of water uses, and excerpts from the Implementation Plans of the Water Quality Standards for Lake Michigan and the St. Joseph River Basin. A listing of municipalities and industries provided details on the status of wastewater treatment facilities.

The Water Quality Standards include timetables for completion of municipal and industrial wastewater treatment facilities. Recommendations of the Conferees of the Conference of Lake Michigan and its Tributary Basin require municipalities to provide year-round effluent disinfection by May 1969,to achieve at least 80 percent reduction of total phosphorus by December 1972, and to control pollution from combined sewers by July 1977. It is indicated that Indiana municipalities will not meet these timetables unless Federal construction grant funds are materially increased.

The following report provides current information on the status of municipal and industrial wastewater treatment and control measures in the Indiana drainage area tributary to Lake Michigan.

Municipal Sewage Treatment

The municipalities of Bristol, Elkhart, Independence Hill Conservancy District, LaGrange, Ligonier, Middlebury, Portage, and South Bend have submitted plans for sewage works projects with total project costs of over $18 million. The projects for Elkhart and Portage include phosphorus removal. These municipalities have also filed applications for construction grants requesting total Federal grant funds of $5.4 million. The projects have not been certified for a grant because sufficient Federal funds are not available. We are encountering extreme resistance from municipalities relative to starting projects without Federal grant funds.

In addition to the preceding projects, East Chicago, Gary, Hammond, Michigan City, and Whiting have studies under way for sewer system and sewage treatment works improvements. Michigan City has completed major additions to its sewage treatment facilities, the Town of Porter is constructing facilities to discharge its sewage to the Town of Chesterton for treatment, and East Gary and the Independence Hill Conservancy District have signed agreements which provide for sewage from these municipalities to be treated by the Gary Sanitary District. The Town of Albion has completed a sewage works project, and the Town of Wakarusa has facilities under construction.

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The City of Portage, which does not have a sanitary sewer system, is the only city in the Lake, Porter and LaPorte County area tributary to Lake Michigan that does not have sewage treatment facilities. The municipalities of Beverly Shores, Dune Acres, Long Beach, Michiana Shores, New Chicago, Odgen Dunes and the Town of Pines, with no recognized sewer systems, are to provide sewage works by 1977.

The Towns of Cromwell, Milford Junction and Topeka, with a total population (1960 census) of 2,218, are the only municipalities in the St. Joseph River sub-basin, with at least a partial sewer system, that do not have sewage treatment facilities. These towns are to provide sewage works by 1972. The municipalities of Middlebury, Millersburg and Wolcottville, with no recognized sewer systems, are to provide sewage works by 1977.

The status of municipal wastewater treatment facilities is shown in Appendix I.

Increased surveillance of wastewater treatment facilities continues to improve operation and maintenance activities. Implementation of the mandatory certification act for operators in responsible charge of wastewater treatment facilities should provide additional improvements. This act was effective July 1, 1968.

With increased construction and financing costs, it is imperative that the Federal construction grant program be funded so that the necessary construction can be undertaken with the least practicable delay.

Semi-Public Sewage Treatment

Increased emphasis is being placed on the requirement for semi-public installations to make connections to area-wide sewage facilities. For example, five subdivisions in the Merrillville Conservancy District area have made connections to the Merrillville sewer system. This system discharges to the Gary sewer system for treatment of sewage and wastes at the Gary Sanitary District plant.

Industrial Waste Treatment

Continued progress has been made on construction of waste treatment facilities at Indiana industries. A total of fifteen projects at thirteen industries have been completed since the first session of the Conference on January 31, 1968. Six projects are under construction and will be completed during the early part of 1969. Twelve additional projects at the four steel mills are under construction with completion dates ranging from the end of 1969 to May 1, 1970. Nine industries are presently preparing plans and specifications for wastewater treatment facilities. One industry has failed to provide adequate plans and specifications for wastewater treatment facilities and legal action has been filed in Lake County Circuit Court concerning enforcement of the Board's pollution abatement order dated June 18, 1968. A listing of industrial plants appears in Appendix II. The details of the time schedules for construction of wastewater treatment facilities appear in Appendix III. These Appendices are revised copies of the material submitted to the Federal Water Pollution Control Administration to comply with Recommendation No. 3, Summary of Conference (First Session) Pollution of Lake Michigan and its Tributary Basin (Wisconsin - Michigan - Indiana - Illinois).

A summary of the time schedules is shown in the following listing:

1. Completion of waste treatment facilities at Adolph Plating Works, Inc., as

rapidly as possible under the action filed in the Lake County Circuit Court.

2. Completion of waste treatment facilities by June 1, 1969:

a. Pennsylvania New York Central Transportation Company, Elkhart.

3. Completion of waste treatment facilities by December 31, 1969:

a. Angola Reduction Company, Angola

b. Continental Can Company, Inc., Elkhart

c. Penn Electric Switch Company. Goshen

d. Middlebury Co-operative Creamery Company, Middlebury

e. Gentner Packing Company, Inc., South Bend

f. Kaiser Jeep Corporation, South Bend

g. Lehman Veal & Poultry Packers, Wakarusa

4. Sinclair Refining Company and American Oil Company have advanced waste treatment systems being designed for construction by August 1, 1970, and December 31, 1970, respectively. The American Oil Company received a Federal research grant of $336.535

from the Federal Water Pollution Control Administration for the project.

5. The four steel mills will complete facilities in accordance with time schedules approved by the Board and agreed to by the Conferees, Conference on Pollution of the Grand Calumet River, Little Calumet River, Calumet River, Lake Michigan and Wolf Lake and Tributaries (Indiana - Illinois) subject to approval by the Secretary of the Interior.

During 1968, inspections were made at 20 industries listed by the Federal Water Pollution Control Administration in an inventory presented during the first session of the Conference that were not listed on the Board's inventory. Ten of these industries are totally served by municipal sewage treatment systems, seven are out of business, and three have been included in the new listing even though two of them dispose of wastewater by ground absorption ponds.

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Status of Implementation of Recommendations of Conferees

The following numbered paragraphs provide current information, on the status of implementation of Recommendations of the Conferees, for the items to be undertaken by the state regulatory agencies.

1. Municipalities have been advised of the requirement for at least 80 percent reduction of total phosphorus. Plans for new wastewater treatment plants or major improvements to existing plants are not approved by the Board unless facilities for phosphorus removal are included or approval is conditioned on the provision of such facilities. Portage and Elkhart have included plans for phosphorus removal in planned sewage works projects. East Chicago's research project for advanced waste treatment includes studies of phosphorus removal, and Gary has retained consulting engineers for recommendations for plant improvements including advanced waste treatment and phosphorus removal. The requirement for phosphorus removal places a burden on small municipalities, and it is likely that operation of these facilities will be a problem in the smaller towns. It

is recommended that the States determine where phosphorus removal is required as long as 80 percent reduction of municipal and industrial sources is obtained within the drainage basin of the respective State.

2. Indiana industries listed in the implementation plans of the Water Quality Standards are scheduled to provide adequate treatment substantially before December 1972.

3. Lists of Indiana municipalities and industries discharging wastewater to the Lake Michigan Basin were submitted to the Conferees on October 30, 1968. Copies of the lists, which have been updated to reflect current conditions, are appended.

4. All municipalities in Lake, LaPorte and Porter Counties with effluent discharge to the basin have effluent chlorination facilities and have been advised of the requirement for continuous disinfection throughout the year. Compliance is anticipated not later than May 1969.

Municipalities in the St. Joseph River drainage basin have been advised of the requirement; however, some municipalities do not have adequate effluent chlorination facilities in operation or under construction. The City of South Bend is under order of the Stream Pollution Control Board to provide effluent chlorination. The city has appealed the Board's order and the case is pending in the Starke County Circuit Court. Ligonier and South Bend have submitted final plans for major improvements including effluent chlorination, and LaGrange has submitted final plans for efflient chlorination; however, none of these municipalities is proceeding to construction. All of these communities have filed applications for Federal grants under PL 660; however, they have not been certified for priorities because sufficient Federal funds are not available to reach these municipalities. Goshen has facilities for effluent chlorination; however, adequate contact time is not provided. Consideration is being given to addition of a contact tank. Ashley does not have facilities. These municipalities will not meet the May 1969 date.

5. Unified collection systems serving contiguous areas are encouraged. In accordance with a recommendation of the Stream Pollution Control Board,

the City of East Gary signed an agreement with the Gary Sanitary District for connection of its sewage collection system to the Gary system rather than providing a separate treatment facility, and the Town of Porter is completing a connection to the Chesterton sewage treatment plant.

6. Detailed information has not been obtained on the extent of the problem relative to the requirement for adjustable overflow regulating devices. Gary has increased the interception of flow above dry weather flow on an average of approximately 10 mgd; in addition, consulting engineers have been retained to prepare a master plan for sewer improvements. This program will receive increased attention in the near future.

7. The Stream Pollution Control Board at a meeting on June 5, 1967, adopted the policy "that sewer construction within a redevelopment area must provide separate stormwater and sanitary waste systems in order to begin a sewer separation in the drainage area even though the stormwater, after separation, would discharge to an existing combined sewer." It has also been the

policy of the Board for some time not to approve combined sewers in new developments. It is anticipated that major pollution from combined sewer overflows will be controlled by July 1977. The City of East Chicago has submitted plans for extensive sewer separation to serve a large urban renewal area and adjacent areas and for a demonstration project, partially financed by an FWPCA grant, to treat combined sewer overflows from another major area. South Bend and Mishawaka have also undertaken sewer separation in urban renewal areas.

8. Discharge of industrial wastes amenable to treatment to municipal sewers is encouraged. Where pretreatment is advisable, it is required.

9. Industrial effluents that include sanitary sewage or suspected of containing pathogenic organisms are being evaluated to determine if there is a deleterious effect on receiving waters.

10. The special committee on nuclear discharges and the thermal aspects of power plants and reactors has submitted a report for consideration of the Conferees.

11. The Corps of Engineers has submitted

reports recommending several sites in Indiana for disposal of dredged material from Indiana Harbor and Michigan City Harbor, Indiana. When sites have been tentatively selected, they will be surveyed relative to pollution hazards and problems that might arise from sites located in flood plains.

12. The Department of Interior and the four States each pledged $250,000 to finance a program to collect the anticipated 1968 die-off of alewives and transport them to onshore disposal sites. Indiana arranged for Bethlehem Steel Corporation to receive the alewives netted adjacent to Indiana and bury them under a sand fill in Bethlehem's riparian landfill at Burns Harbor. Although the die-off was very light, sufficient fish were obtained to test the collection and disposal setup. Some of the collection and disposal problems have been resolved and it is anticipated that if a significant die-off is predicted in the future, a similar program could be undertaken, if adequate financing is made available.

13. A bill has been introduced in the Indiana General Assembly to amend a 1957 act concerning

the operation of watercraft. The provision of the original bill, which excluded Indiana waters of Lake Michigan, would be deleted by the proposed bill. The bill also includes the provisions recommended by the subcommittee on "Wastes from Watercraft" approved by the Conferees on March 2, 1968.

14. In addition to the situations mentioned in Item 5, other contiguous urbanized areas are encouraged to use area-wide sewage facilities. The Merrillville Conservancy District in Lake County is serving 2,463 homes. This includes the sewage from five subdivisions that formerly operated small sewage treatment plants and many homes that were served by septic tank absorption systems. A new sanitary sewer system to serve the Independence Hill Conservancy District will also connect to Merrillville Conservancy District sewers. A private utility north and east of South Bend is serving homes and commercial facilities adjacent to U. S. 31 that formerly were served by small treatment plants and septic tank absorption systems. Sewage and wastes from the utility sewer system are discharged to the South Bend sewage treatment plant.

15. The technical committee on pesticides has submitted a report for consideration of the Conferees. A pesticide control bill has been introduced in the Indiana General Assembly.

17. The committee appointed to develop specific recommendations for a coordinated four State-Federal monitoring program has submitted a report for consideration of the Conferees. An additional monitor station has been added on Trail Creek in Michigan City and additional analyses are being made on all monitor stations in accordance with monitor committee recommendations.

18. The inventory of sites where potential exists for major spills of oil and other hazardous material was submitted to the Conferees on October 30, 1968. Copies of the lists, Appendix IV, V and VI,are appended.

19. The monitor committee report recommends a list of uniform water quality analyses to be performed at the selected water filtration plants with water intakes in Lake Michigan. It is recommended that monthly analyses include those recommended for open water

sampling stations. Indiana will complete the analyses that cannot be accomplished by the Gary and Michigan City water filtration plant laboratories.

21. The Indiana Water Quality Standards require that the effluents from municipal and industrial wastewater treatment plants be substantially free of visible oil.

REPORT

RECOMMENDATION NO. 3

Lake Michigan - Four State Enforcement Conference

Recommendation No. 3 of the Summary of Conference (First Session) Pollution of Lake Michigan and its Tributaries (Wisconsin - Illinois - Indiana - Michigan) requires that each State shall prepare a list of municipalities and industries discharging wastewater to the Lake Michigan Basin. Each source shall indicate whether it discharges pollutants having a deleterious effect on Lake Michigan. Detailed action plans for treatment of all wastes having a deleterious effect on Lake Michigan waters are to be developed. The plans shall identify the principal characteristics and include a timetable for construction of needed facilities.

Appendix I lists municipalities that discharge effluents and wastewater into waters of the Lake Michigan Basin. The list shows the improvements required, the timetable and the status of plans under the remarks column.

Appendix II shows a listing of all industries that discharge wastewater into waters of the Lake Michigan Basin. Appendix III outlines programs and time schedules for those industries listed as inadequate. It should be noted that treated wastewater discharged into the Little Calumet River (West), Grand Calumet River (West), and Wolf Lake does not enter Lake Michigan.

Indiana Stream Pollution Control Board
Revised February 1969

APPENDIX I

Municipal Wastewater Treatment
Lake Michigan Basin - St. Joseph River

Municipality	Population 1960 (or Later Census)	Type of Treatment	Year Completed	Design Flow mgd	Present Flow mgd	Receiving Stream	Improvements Required	Time-Table	Remarks
Albion	1,325	Lagoon, chlorination	1968	0.15	0.08 (est.)	Tributary to Elkhart River	-	-	-
Angola	4,746	Trickling filter, chlorination	1963*	0.85	0.80	Pigeon Creek, Pigeon River	Phosphate removal	As soon as practicable	Under consideration.
							Advanced waste treatment	1977	-
Ashley	721	Activated sludge, 7-day terminal lagoon	1966	0.08	0.05	Tributary to Turkey Creek, Pigeon River	Chlorination	1969**	-
Cromwell	451	None	-	-	-	Turkey Creek, Elkhart River	Treatment and chlorination	1972	-
Elkhart	40,274	Primary, chlorination	1955	12.0	12.0 to 15.00	St. Joseph R.	Expansion and secondary treatment	1969	Plans approved
							Phosphate removal	1972	Plans prepared
Fremont	937	Trickling filter, chlorination	1958	0.15	0.12	Tributary to Crooked Creek, Fawn River	-	-	-
Goshen	13,718	Activated sludge, chlorination	1963*	3.50	2.40	Elkhart River	Chlorination Phosphate removal	1969** 1972	Contact tank required.

APPENDIX I

Municipal Wastewater Treatment
Lake Michigan Basin - St. Joseph River (continued)

Municipality	Population 1960 (or Later Census)	Type of Treatment	Year Completed	Design Flow mgd	Present Flow mgd	Receiving Stream	Improvements Required	Time-Table	Remarks
Kendallville	6,765	Trickling filter, chlorination	1958*	1.44	1.40	Henderson Lake, North Branch Elkhart River	Phosphate removal	As soon as practicable	Under study.
LaGrange	1,990	Trickling filter	1958	0.38	0.19	Fly Creek, Pigeon River	Chlorination	1969**	Plans approved
Ligonier	2,595	Primary	1941	0.20	0.25	Elkhart River	Chlorination	1969**	
							Expansion and secondary treatment	1972	Plans approved
Milford Junction	1,167	None	-	-	-	Turkey Creek, Elkhart River	Secondary treatment and chlorination	1972	Plans approved
Mishawaka	33,361	Activated sludge, chlorination	1952 1966*	8.30	9.00(1)	St. Joseph R.	Expansion and phosphate removal	1972	-
Nappannee	3,895	Activated sludge, chlorination	1963	0.90	0.70	Tributary Turkey Creek, Elkhart River	-	-	-
South Bend	132,445	Activated sludge	1955	24.0(Sec.) 48.0(Prim.)	32.00(1)	St. Joseph R.	Chlorination	As soon as practicable	Plans approved
							Expansion, phosphate removal	1972	Plans submitted. (Not including phosphate removal.)

APPENDIX I

Municipal Wastewater Treatment
Lake Michigan Basin - St. Joseph River (continued)

Municipality	Population 1960 (or Later Census)	Type of Treatment	Year Completed	Design Flow mgd	Present Flow mgd	Receiving Stream	Improvements Required	Time-Table	Remarks
Syracuse	1,595	Trickling filter, chlorination	1962	0.25	0.20	Turkey Creek, Elkhart River	-	-	-
Topeka	600	None	-	-	-	Little Elkhart R.	Treatment and chlorination	1972	-
Wakarusa	1,145	None	-	-	-	Baugo Creek, Elkhart River	Treatment and chlorination	1972	Under construction.

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(1) All dry weather flow is receiving secondary treatment

* Last major Improvement

** Recommendation of the Conferees

___ Underlined items designate changes since October 30, 1968.

Note: The incorporated municipalities of Middlebury, Millersburg, and Wolcottville, with public water supplies and no recognized sewer system, will need to provide adequate sanitary sewer systems and sewage treatment facilities by 1977.

APPENDIX I

Municipal Waste
Lake Michigan Basin
Lake, Porter, and LaPorte Counties

Municipality	Population 1960 (or Later Census)	Type of Treatment	Year Completed	Design Flow mgd	Present Flow mgd	Receiving Stream	Improvements Required(1)	Time-Table	Remarks
Chesterton	4,355	Activated sludge, chlorination	1963	1.50	1.06	Little Calumet R., Burns Ditch	-	-	-
Crown Point	8,443	Activated sludge, chlorination	1966*	1.80	0.90	Beaver Dam Ditch, Deep River, Burns Ditch	Advanced waste treatment	1977	-
East Chicago	57,669	Activated sludge, chlorination	1960*	20.00	14.00	Grand Calumet R., Indiana Harbor	Advanced waste treatment Storm water disinfection and control	As soon as practicable As soon as practicable	Pilot studies underway with Federal grant Demonstration project proposed with Federal grant.
East Gary	9,309	Trickling filter, chlorination	1960*	1.30	1.00	Burns Ditch	-	-	Agreement signed for connection to Gary.
Gary	178,320	Activated sludge, chlorination	1965*	60.00 +20.00 Additional primary capacity	42.50	Grand Calumet R., Indiana Harbor	Advanced waste treatment Storm water disinfection and control	As soon as practicable As soon as practicable	Master plan underway. Master plan underway.
Hammond	111,698	(Treatment required of storm and combined sewer overflows to Lake Michigan)					Disinfection and control	1970	Preliminary report submitted.

APPENDIX I

Municipal Waste
Lake Michigan Basin
Lake, Porter, and LaPorte Counties (continued)

Municipality	Population 1960 (or Later Census)	Type of Treatment	Year Completed	Design Flow mgd	Present Flow mgd	Receiving Stream	Improvements Required (1)	Time-Table	Remarks
Whiting	8,137	(Treatment required of storm and combined sewer overflows to Lake Michigan)					Disinfection and control	1970	Preliminary study underway.
Hobart	18,680	Activated sludge, chlorination	1962*	2.00	1.30	Deep River, Burns Ditch	Advanced waste treatment	1977	-
Michigan City	36,653	Activated sludge, chlorination	1968*	15.00	12.00	Trail Creek	Advanced waste treatment	As soon as practicable	-
Portage	16,490	None	-	-	-	Burns Ditch	Treatment and chlorination	1970	Plans approved
Porter	2,189	None	-	-	-	Calumet River, Burns Ditch	Treatment and chlorination	Now	Connection to Chesterton sewage treatment plant under construction.
Valparaiso	15,227	Activated sludge, chlorination	1954	2.00	2.35	Salt Creek, Little Calumet, Burns Ditch	Expansion Advanced waste treatment	1972 1977	- -

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(1) 80 percent phosphorus reduction required of the preceding municipalities by 1972 (excluding Hammond and Whiting).

* Last major improvement

Note: The incorporated municipalities of Beverly Shores, Dune Acres, Long Beach, Michiana Shores, New Chicago, Ogden Dunes, and the Town of Pines with public water supplies and no recognized sewer systems are to provide sewage works by 1977.

___ Underlined items designate changes since October 30, 1968.

APPENDIX II
Industrial Waste Treatment Control Facilities
Lake Michigan Basin

Industry	Sewage Disposal	Industrial Waste Facilities	Status	Waste Flow mgd	Receiving Stream
St. Joseph River					
Angola Reduction Company Angola	Septic tank - absorption system	Grease separation basin and septic tank	I	0.010	Silver Lake
Weatherhead Corporation Angola	Angola Sewer	Oil separation, ion exchange with water reuse, cyanide destruction, chromium reduction, and cyanide isolation facilities	A	0.175	Tributary of Crooked Lake
Bristol Band Instrument Company Bristol	Septic tank - absorption system	Cyanide isolation and soil absorption	A	0.010	None
Continental Can Company Elkhart	Elkhart Sewer	Bar screens, chemical treatment and clarification	I	4.0	Elkhart River
Elkhart Packing Company Elkhart	Septic tank - absorption system	Grease separation, blood collection, and soil absorption pond	A	0.040	None
Pennsylvania New York Central Transportation Company Elkhart	Elkhart Sewer	Oil separation and soil absorption ponds	I	0.050	Honey Creek
John L. Whisler and Son, Inc. Elkhart	Septic tank - absorption system	Fine screens, blood collection, grease separation, and soil absorption ponds	A	0.150	None

Appendix II continued

Industry	Sewage Disposal	Industrial Waste Facilities	Status	Waste Flow mgd	Receiving Stream
Penn Electric Switch Company Goshen	Goshen Sewer	Cyanide isolation and settling tank	I	0.225	Rock Run
Pine Manor, Inc. Goshen	Goshen Sewer	Grease separation blood collection, and soil absorption pond	A	0.040	None
Kendallville Fertilizer Company Kendallville	Septic tank - absorption system	Septic tanks and waste stabilization pond	A	0.020	Henderson Creek
Springer Corporation Ligonier	Septic tank - absorption system	Oil separation tank	A	0.015	Elkhart River
Middlebury Co-operative Creamery, Inc. Middlebury	Septic tank - absorption system	Septic tanks and broad irrigation	I	0.025	Little Elkhart River
Cecil Foods, Inc. Milford	Septic tank - absorption system	Soil absorption pond	A	0.020	None
Maple Leaf Farm Processing Plant Milford	Septic tank - absorption system	Waste stabilization pond	A	0.080	Waubee Lake
Indiana-Michigan Electric Company Twin Branch Station Mishawaka	Septic tank - absorption system	Ash settling ponds	A	84.0	St. Joseph River
U. S. Rubber Company Mishawaka	Mishawaka Sewer	In-plant control, primary clarification, chemical treatment, flocculation, clarification and vacuum filtration	A	1.300	St. Joseph River
Animal By-Products Corporation New Carlisle	Septic tank - absorption system	Soil absorption pond	A	0.020	None

Appendix II continued

Industry	Sewage Disposal	Industrial Waste Facilities	Status	Waste Flow mgd	Receiving Stream
New Paris Creamery Company New Paris	Septic tank - absorption system	None	A	0.225	Turkey Creek
Polo Produce, Inc. New Paris	Septic tank - absorption system	Fine screens, blood collection, grease separation, and soil absorption pond	A	0.050	None
County Line Cheese Company Shipshewana	Septic tank - absorption system	Ridge and furrow irrigation	A	0.015	None
Kaiser Jeep Corporation South Bend	Septic tank - absorption system	None	I	0.020	Bowman Creek
Gentner Packing Company South Bend	Septic tank - absorption system	Blood collection, grease separation, and anaerobic-aerobic waste stabilization pond system	I	0.215	Autin Ditch
Weatherhead Corporation Syracuse	Syracuse Sewer	Cyanide destruction and cyanide isolation	A	0.225	Turkey Creek
Lehman Veal and Poultry Packers Wakarusa	None	None	I	0.030	Bouga Creek
Grand Calumet River - Indiana Harbor Ship Canal - Lake Michigan					
Northern Indiana Public Service Company, Bailly Station Baileytown	Septic tank - absorption system - no discharge	Ash disposal with soil absorption of sluicing water - no discharge	A	--	Lake Michigan
American Steel Foundries Company East Chicago	East Chicago Sanitary District	Settling basin	A	.500	Indiana Harbor Ship Canal
Blaw Knox Company East Chicago	East Chicago Sanitary District	Settling tank and filter	A	.425	Indiana Harbor Ship Canal

Appendix II continued

Industry	Sewage Disposal	Industrial Waste Facilities	Status	Waste Flow mgd	Receiving Stream
Cities Service Oil Company East Chicago	East Chicago Sanitary District	Oil separation tanks ammonia-sulfide strippers, and separate disposal of waste caustic and acids	**	73	Grand Calumet River
E. I. DuPont de Nemours & Co., Inc. East Chicago	East Chicago Sanitary District	Acid neutralization facilities, settling basin, and controlled discharge	A	9.60	Grand Calumet River
Inland Steel Company East Chicago	Three trickling filter plants with effluent chlorination	Coke plant cooling water recirculation, phenol extraction, napthalene recovery, and discharge of ammonia still wastes to East Chicago Sanitary District sewers, scale pits, oil separator, flue dust thickeners, chemical clarification facilities and deep well disposal system for waste pickle liquor	I	900.00	Indiana Harbor Ship Canal and Lake Michigan
M & T Chemicals Company East Chicago	East Chicago Sanitary District	Spent caustic sold for recovery and settling pond	A	.075	Indiana Harbor Ship Canal
Mobil Oil Company East Chicago	East Chicago Sanitary District	Oil separators, ammonia sulfide stripper, in-plant control, ballast tank oil separator, and separate disposal of waste caustics and acids	**	2.50	Indiana Harbor Ship Canal

Appendix II continued

Industry	Sewage Disposal	Industrial Waste Facilities	Status	Waste Flow mgd	Receiving Stream
Sinclair Refining Company East Chicago	East Chicago Sanitary District	Oil separators, ammonia sulfide stripper, in-plant control, ballast tank oil separator and separate disposal of waste caustics and acids	**	5.50	Indiana Harbor Ship Canal
U. S. Gypsum Company East Chicago	East Chicago Sanitary District	Settling basin and save-all clarifiers	A	4.50	Indiana Harbor Ship Canal
Union Carbide Chemical Corporation Linde Air Division East Chicago	East Chicago Sanitary District	Settling ponds and oil separation	A	.250	Indiana Harbor Ship Canal
Youngstown Sheet and Tube Company East Chicago	East Chicago Sanitary District	Scale pits, oil separators, phenol extraction, napthalene recovery, flue dust thickeners, disposal of waste pickle liquor and halogen line solutions on slag fill and lagoon	I	250.00	Indiana Harbor Ship Canal and Lake Michigan
Vulcan Materials Company Gary	Septic tank - absorption system	Spent caustic sold for recovery	A	--	Grand Calumet River
American Maize-Products Company Hammond	Hammond Sanitary District	In-plant control, anaerobic lagoon, aerated lagoon, starch filtrate clarifiers, chlorination, and some waste discharged to Hammond sewers	A	14.00	Lake Michigan
Commonwealth Edison Co., Inc. Hammond	Chicago Sanitary District	Fly ash settling bins and bottom ash settling basins	A	1000.00	Lake Michigan

Appendix II continued

Industry	Sewage Disposal	Industrial Waste Facilities	Status	Waste Flow mgd	Receiving Stream
American Oil Company Whiting	Whiting Sewers	Oil separators and aerated lagoon	**	140.00	Lake Michigan
Union Carbide Chemical Corporation Chemicals Division Whiting	Whiting sewers and East Chicago Sanitary District	Oil separators, settling basins, and in-plant control	**	54.00	Lake Michigan and Indiana Harbor Ship Canal
Union Tank Car Company Whiting	Hammond Sanitary District	Oil separation and discharge to the Hammond Sanitary District	A	.030	Indiana Harbor Ship Canal.
American Bridge Division U. S. Steel Corporation Gary	Gary Sanitary District	None	A	--	Grand Calumet River
Gary Sheet and Tin Mill U. S. Steel Corporation Gary	Gary Sanitary District	Scale pits, waste pickle liquor absorption lagoon and oil separators	I	63.00	Grand Calumet River
Gary Steel Works U. S. Steel Corporation Gary	Gary Sanitary District	Scale pits, flue dust thickeners, settling basins, seepage lagoon, and discharge of portion of coke plant wastes to Gary Sanitary District	I	370.00	Grand Calumet River and Lake Michigan
National Tube Division U. S. Steel Corporation Gary	Gary Sanitary District	None	A	41.0	Grand Calumet River
Northern Indiana Public Service Company, Mitchell Station Gary	Septic tank - subsurface sand	Fly ash and bottom ash settling ponds	A	440.00	Lake Michigan

Appendix II continued

Industry	Sewage Disposal	Industrial Waste Facilities	Status	Waste Flow mgd	Receiving Stream
Steiner Tissue Division Georgia-Pacific Corporation Gary	Gary Sanitary District	Save-all clarifiers	I	1.00	Grand Calumet River
Universal Atlas Cement Company U. S. Steel Corporation Gary	Trickling filter	Oil separation	A	12.00	Lake Michigan
Little Calumet River - Burns Ditch - Lake Michigan					
Bethlehem Steel Corporation Burns Harbor Plant Chesterton	Activated sludge, chlorination and discharge to terminal lagoon	Scale pits, chemical flocculation-clarification units, oil separators, acid neutralization, deep well disposal system, cyanide isolation facilities and terminal lagoon	A	130.00	Little Calumet River
American Chemicals Company Griffith	Septic tank - absorption system	Incineration and waste holding lagoon	A	--	Tributary Turkey Creek
Great Lakes Dressing Plant Michigan City	Septic tank - absorption system	Waste absorption pond	A	--	Trail Creek
American Cyanamid Company Michigan City	Septic tank - absorption system	Settling basins and deep well disposal system	A	--	Trail Creek
Northern Indiana Public Service Co. Michigan City	Septic tank - absorption system	Ash settling ponds	A	--	Lake Michigan
Phillips Drill Company Michigan City	Septic tank - absorption system	Oil separator	A	.025	Trail Creek

Appendix II continued

Industry	Sewage Disposal	Industrial Waste Facilities	Status	Waste Flow mgd	Receiving Stream
Royal Metal Corporation Michigan City	Activated sludge	Ion exchange, settling tank and settling lagoon	A	.040	Trail Creek
Midwest Steel Division National Steel Corporation Portage	Activated sludge with chlorination	Cyanide isolation facilities, chemical treatment with clarification, and deep well disposal system	A	4.5	Burns Ditch
Vale City Packing Company Valparaiso	Septic tank - absorption system	Septic tank and absorption system	A	.015	None
Indiana General Corporation Valparaiso	Septic tank - absorption system	Absorption pond	A	.030	None
Little Calumet River (West)					
Simmons Company Munster	Hammond Sanitary District	Cyanide destruction and chromium reduction	A	--	Little Calumet River
Grand Calumet River (West)					
Adolph Plating, Inc. East Chicago	East Chicago Sanitary District	Cyanide isolation facilities	I	.075	Grand Calumet River
LaSalle Steel Company Hammond	Hammond Sanitary District	Acid neutralization and clarification	A	--	Grand Calumet River
Wolf Lake					
Lever Brothers Company Hammond	Hammond Sanitary District	In-plant control, air flotation, effluent chlorination, and discharge of some waste to Hammond Sanitary District	***	9.7	Wolf Lake

A Adequate
I Inadequate
Underlined items designate changes since October 30, 1968
** Will be required to provide additional control of threshold-odor substances if studies show the need.
*** Complies with water quality criteria at the control point on Wolf Lake, but additional work is needed to improve conditions in Wolf Lake Channel.

APPENDIX III

Industry and Location	Significant Contaminant	Project Planned	Completion Date
Angola Reduction Company Angola	BOD, grease, and suspended solids	Plans being prepared	December 31, 1969
Weatherhead Corporation Angola	Oil, cyanide, heavy metals	Elimination of use of cyanide, chemical treatment, clarification and sand filtration	Completed 1968
Continental Can Company Elkhart	BOD and suspended solids	Chemical treatment and clarification facilities	December 31, 1969 (Facilities completed during 1968 being evaluated)
Pennsylvania New York Central Transportation Company, Elkhart	BOD, oil and suspended solids	Plans being prepared	June 1, 1969
Penn Electric Switch Company Goshen	Cyanide and heavy metals	Plans being prepared	December 31, 1969
Middlebury Co-operative Creamery, Inc., Middlebury	BOD and suspended solids	Connection to proposed municipal system planned	December 31, 1969
New Paris Creamery, Inc. New Paris	BOD and suspended solids	Aerated lagoon	Completed 1968
Gentner Packing Company South Bend	BOD and suspended solids	--	December 31, 1969
Kaiser Jeep, Inc. South Bend	Zinc and phosphate	Plans being prepared	December 31, 1969
Lehman Veal and Poultry Packers Wakarusa	BOD, grease, and suspended solids	Plans connection to municipal treatment system when it is constructed	December 31, 1969

APPENDIX III

Industry and Location	Significant Contaminant	Project Planned	Completion Date
Cities Service Oil Company East Chicago	BOD, oil, and threshold odor substances	Advanced waste treatment	December 31, 1970
E. I. DuPont de Nemours and Company, Inc. East Chicago	Acidity and suspended solids	Improvements to acid neutralization facilities and settling facilities for diatomaceous earth filter aid	Completed 1968
Inland Steel Company East Chicago	Ammonia, cyanide, phenols, oils, BOD, and suspended solids	Permanent connection of Plant Nos. 2 and 3 Coke Plant ammonia still wastes and selected wastes to the East Chicago Sanitary District sewerage system	Completed 1967
Inland Steel Company East Chicago	Ammonia, cyanide, phenols, oils, and suspended solids	Additional settling basins and recirculation pumps installed at the Coke Quenching Stations in Plant Nos. 2 and 3 Coke Plants	Completed 1968
Inland Steel Company East Chicago	Oils and suspended solids	Plant Nos. 2 and 3 Blast Furnace Area in-plant controls and secondary flue dust settling basins	Completed 1968
Inland Steel Company East Chicago	Acidity, suspended solids, and iron	Deep well disposal system. (No discharge to receiving stream.)	Completed 1967

Appendix III continued

Industry and Location	Significant Contaminant	Project Planned	Completion Date
Inland Steel Company East Chicago	Oils and suspended solids	12-inch Merchant Mill waste treatment plant	November 30, 1968 (Will be operative when Mill begins operation in first quarter of 1969.)
Inland Steel Company East Chicago	Oils, suspended solids, and iron	Terminal settling and oil skimming basin	May 1, 1970
M & T Chemicals Company East Chicago	Ammonia nitrogen, BOD, and suspended solids	Connection to the East Chicago Sanitary District sewerage system	Completed 1968
Mobil Oil Company East Chicago	BOD, oil, suspended solids, and threshold odor substances	Air flotation and water reuse	December 31, 1968 (Will be completed during February, 1969.)
Sinclair Refining Company East Chicago	BOD, oil, suspended solids, and threshold odor substances	Storm water retention tank, API presettling tank, tank farm drainage system and oil skimmer	Completed 1968
Sinclair Refining Company East Chicago	BOD, oil, suspended solids, and threshold odor substances	Advanced waste treatment	August 1, 1970
Youngstown Sheet & Tube Company East Chicago	Ammonia, cyanide, phenols, oils, BOD, and suspended solids	Coke Plant - Construction of napthalene scrubbers and connection of waste to the East Chicago Sanitary District	Completed 1967
Youngstown Sheet & Tube Company East Chicago	Oil and suspended solids	No. 2 Open Hearth - Clarification facilities, cooling towers and water reuse system (No discharge to receiving stream.)	Completed 1967

Appendix III continued

Industry and Location	Significant Contaminant	Project Planned	Completion Date
Youngstown Sheet & Tube Company East Chicago	Free oil, emulsified oil, suspended solids, and iron	No. 3 Hot Strip Mill - Oil and solids removal, chemical flocculation, scale pits, and filtration facilities	Completed 1967
Youngstown Sheet & Tube Company East Chicago	Oil and suspended solids	Buttweld Mill - Pressure filters for solids removal	December 31, 1968 (Will be completed during February, 1969.)
Youngstown Sheet & Tube Company East Chicago	Oils and suspended solids	No. 1 Tin Mill, No. 2 Cold Reduced Sheet Mill - Central water treatment plant for chemical treatment of oils and suspended solids	December 31, 1969
Youngstown Sheet & Tube Company East Chicago	Oils and suspended solids	Hot Rolling Mills - Terminal lagoon for secondary clarification of effluent from lake front scale pit	June 30, 1969
Youngstown Sheet & Tube Company East Chicago	Acidity, suspended solids, oils and iron	No. 2 Cold Reduced Sheet Mill - Sumps, pumps, and sewers to collect waste pickle liquor; and sumps, pumps, and sewers to collect oily wastes	December 31, 1969

Appendix III continued

Industry and Location	Significant Contaminant	Project Planned	Completion Date
Youngstown Sheet & Tube Company East Chicago	Cyanide, oils, and suspended solids	Blast Furnace - Sewers, sumps, and pumps to collect and recirculate all clarified waste from the Blast Furnace. No discharge to receiving stream	June 30, 1970
Youngstown Sheet & Tube Company East Chicago	Oils and suspended solids	North Lagoon - A settling lagoon to collect treated wastes from the No. 5 Stand of the Tandem Rolling Mill, Sewer No. 23, and the No. 3 Hot Strip Mill. All effluent from the lagoon will be recirculated. No discharge to receiving stream	June 30, 1970
American Maize-Products Company Hammond	BOD and suspended solids	Additional aeration capacity for lagoon system water reuse and other in-plant controls (1)	December 31, 1968 (Will be completed during the first quarter of 1969.)
American Oil Company Whiting	BOD, oil, suspended solids and threshold odor substances	Improved control and separation of oil in cooling water and new Ballast Water Separation Facilities	Completed 1968

(1) Currently discharged to Hammond sewer system.

Appendix III continued

Industry and Location	Significant Contaminant	Project Planned	Completion Date
American Oil Company Whiting	BOD, oil, suspended solids and threshold odor substances	Advanced waste treatment for process water	December 31, 1970
Union Carbide Corporation Chemicals Division Whiting	BOD, oil, suspended solids, and threshold odor substances	Additional in-plant controls, equalization tank and discharge of certain wastewater to the East Chicago Sanitary District sewerage system	Completed 1968
Gary Sheet & Tin Mill U. S. Steel Corporation Gary	Suspended solids, free oils, emulsified oils, BOD, and iron	6-Stand Tandem Cold Reduction Mill facilities	Completed 1967
Gary Sheet & Tin Mill U. S. Steel Corporation Gary	Suspended solids, oils, and iron	84-inch Hot Strip Mill filtration facilities	Completed 1967
Gary Sheet & Tin Mill U. S. Steel Corporation Gary	Acidity and iron	Deep well disposal system. No discharge to receiving stream	Completed 1967
Gary Sheet & Tin Mill U. S. Steel Corporation Gary	Iron, acidity, and suspended solids	Acid rinse waters from the existing Sheet and Tin Mill 66-inch Continuous Pickling Line and the New 84-inch Continuous Pickling Line will be diverted to the existing 6-Stand Tandem Cold Reduction Mill waste treatment plant	Completed 1968

Appendix III continued

Industry and Location	Significant Contaminant	Project Planned	Completion Date
Gary Sheet & Tin Mill U. S. Steel Corporation Gary	Suspended solids, free oils, emulsified oils, and iron	Oily wastewater from the 80-inch 5-Stand Cold Reduction Mill treatment plant will be diverted to the 6-Stand Tandem Cold Reduction Mill waste treatment plant	Completed 1968
*Gary Sheet & Tin Mill U. S. Steel Corporation Gary	Iron, suspended solids, free oils, emulsified oils, BOD	Segregated wastewater from Tin Mill will be discharged to the existing 6-Stand Tandem Cold Reduction Mill waste treatment plant	June 30, 1969
*Gary Sheet & Tin Mill U. S. Steel Corporation Gary	Iron, suspended solids, free oils, emulsified oils, BOD	Segregated wastewater from Sheet Mill will be discharged to the expanded 6-Stand Tandem Cold Reduction Mill waste treatment facilities	June 30, 1969
*Gary Sheet & Tin Mill U. S. Steel Corporation Gary	Iron, suspended solids, and oils	Wastewater from the 80-inch Hot Strip Mill scale pits will be diverted to the expanded 84-inch Hot Strip Mill Filtration Plant	March 1, 1970

*In order to handle the additional waste loadings listed in Items Nos. 6 and 7, additional primary solids and oil skimming, flocculation-clarification, and oil and solids handling facilities will be constructed at the 6-Stand Tandem Cold Reduction Mill waste treatment facilities (~~Thermal~~ Terminal Treatment Plant). Additional filtration facilities will be added to the 84-inch Hot Strip Mill waste treatment plant to handle the waste load listed in Item No. 8. The expansion of both the terminal treatment plant and the Hot Strip Mill will be completed by March 1, 1970.

Appendix III continued

Industry and Location	Significant Contaminant	Project Planned	Completion Date
Gary Steel Works U. S. Steel Corporation Gary	Ammonia, cyanide, phenols, oils, BOD, and suspended solids	Coke Plant - Permanent connection of Coke Plant wastes into the Gary Sanitary District sewerage system and in-plant controls and waste separation	December 31, 1968 (Will be completed during the early part of 1969. Waste is being temporarily used to quench coke.)
Gary Steel Works U. S. Steel Corporation Gary	Oils and suspended solids	Blast Furnace Area - Additional settling basins for flue dust, oil separators in power station and waste segregation	December 1, 1969
Gary Steel Works U. S. Steel Corporation Gary	Oil and suspended solids	Steel Making Area - Construction of oil separators and segregation of wastewater with discharge to Blast Furnace Area flue dust settling basins	December 31, 1969
Gary Steel Works U. S. Steel Corporation Gary	Oil and suspended solids	Hot Mills Area - Construction of sewers, pumps, sumps, piping, and settling and oil skimming basins	December 31, 1969
Gary Tube Works U. S. Steel Corporation Gary	Acid and iron	Waste pickle liquor collection system. No discharge to receiving stream.	Completed 1967
Gary Tube Works U. S. Steel Corporation Gary	Oil and suspended solids	Solids clarification and oil skimming facilities	Completed 1968

Appendix III continued

Industry and Location	Significant Contaminant	Project Planned	Completion Date
Steiner Tissue Division Georgia-Pacific Corporation Gary	BOD, oil, and suspended solids	Chemical pretreatment and clarification facilities and discharge to the Gary Sanitary District sewerage system	December 31, 1968 (Late delivery of equipment has delayed construction)
Phillips Drill Company Michigan City	Oil	Oil separation	Completed 1968
Adolph Plating, Inc. East Chicago	Oil, cyanide, and heavy metals	Oil separation, cyanide destruction and clarification	December 31, 1968 (Attorney General has filed in Lake County Circuit Court for enforcement)
Lever Brothers Company Hammond	BOD, oils, and suspended solids	Scrub-vactor on fatty acid still	Completed January 1969

____Underlined items designate changes since October 30, 1968

P. E. Miller

REPORT

RECOMMENDATION NO. 18

LAKE MICHIGAN - FOUR STATE ENFORCEMENT CONFERENCE

Recommendation No. 18 of the Summary of Conference (First Session) Pollution of Lake Michigan and its Tributaries (Wisconsin - Illinois - Indiana - Michigan) requires that each State shall compile an inventory of all sites where potential exists for major spills of oil and other hazardous materials which may affect the water quality of Lake Michigan and that each State require that measures be taken where necessary to prevent escape of this material to the receiving waters.

The Stream Pollution Control Board has had in force since 1953 a Regulation that requires that all concentrated cyanide solutions and compounds be isolated from any drain connected directly or indirectly to a water course. Appendix IV lists the location and names of industries that use cyanogen compounds. Only Standard Plating Company, Goshen, does not have its cyanide solutions isolated and plans and specifications have been submitted for isolation facilities and for the needed facilities. All other industries listed have adequate isolation facilities.

In the Indiana portion of the Lake Michigan Basin, there are many locations where significant quantities of oil are stored and handled. These include oil refineries, pipelines, terminals, tank farms and general industrial storage. Appendix V lists major facilities of this type that are known. It should be pointed out that Rules and Regulations of the Indiana State Fire Marshall regulates the use, handling, and storage of flammable liquids in the State of Indiana. (Flammable liquids meaning any liquid having a flash point below 200° F.) The Regulation provides for minimum specifications for storage tanks, haulage tanks, pipelines, etc., and provisions for enclosure of storage tanks within dikes.

There are several industries in the basin that manufacture, produce, or use in their production process chemicals that could cause damage to the receiving stream should the materials escape. Appendix VI shows a list of industries known to be handling significant amounts of oil and/or hazardous materials.

Indiana Stream Pollution Control Board
Revised February 1969

APPENDIX IV

LAKE MICHIGAN BASIN

CYANIDE USERS

LOCATION	COMPANY
Chesterton	Bethlehem Steel Corporation
East Chicago	Edwards Valve, Inc.
	Youngstown Sheet & Tube Company
	Inland Steel Corporation
	Adolph Plating, Inc.
Gary	Gary Screw & Bolt Company
	Anderson Company
Hammond	S. G. Taylor Chain Company
Michigan City	Indiana Industrial Plating, Inc.
	Triplex Plating Corporation
Munster	Simmons Company, Central Division
Portage	Midwest Steel Division, National Steel Corp.
Valparaiso	McGill Manufacturing Company, Inc.
Angola	Weatherhead Company
Bristol	Bristol Band Instrument Company
Elkhart	H & A Selmer, Inc.

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	Elkhart Heat Treat, Inc.
	Elkhart Products Corporation
	C. G. Conn Limited
	Boomershine Metal Finishing
	Buesher Band Instrument Company
	Anderson Silver Plating Company
	Adams Westlake Company
	Martin Bank Instrument Company
	Levan Metal Sash Company
	K. M. Kiefer & Sons, Inc.
	Ideal Plating Corporation
	Halls Silver Shop, Inc.
	South Side Plating Works
	Godfrey Conveyor Company
	Finnell Systems, Inc.
	Excel Corporation
Goshen	Penn Electric Switch Company
	Artco Metal Finishing Company
	Standard Plating Company
Mishawaka	Cronk Body Shop, Inc.
	Remote Controls, Inc.
	Jontz Manufacturing Company

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South Bend	Steel Warehouse, Inc.
	Roach Appleton Manufacturing Company
	Heat Treat, Inc.
	Bendix Corporation
	Martin Machine, Inc.
	Michiana Plating Company
	Huckins Tool and Die, Inc.
	Swanson Plating Works
Syracuse	Weatherhead Company

APPENDIX V

LAKE MICHIGAN BASIN
REFINERIES, PIPELINE, TERMINALS, AND TANK FARMS HANDLING SIGNIFICANT AMOUNTS OF OIL

LOCATION	INDUSTRY	TYPE OF FACILITY	MEASURES NEEDED TO PREVENT THE ESCAPE OF THIS MATERIAL
REFINERIES			
Whiting	American Oil Company	Refinery, terminal, pipelines, and storage tanks	Increased care in handling oil
East Chicago	Sinclair Refining Company	Refinery, terminal, pipelines,and storage tanks	Increased care in handling oil
East Chicago	Mobil Oil Company	Refinery, terminal, pipelines, and storage tanks	Increased care in handling oil
East Chicago	Cities Service Oil Company	Refinery, terminal, pipelines,and storage tanks	Increased care in handling oil
PIPELINES			
Lake County Porter County LaPorte County St. Joseph County Elkhart County LaGrange County Steuben County	Sinclair Pipeline Company	8-inch pipeline from East Chicago to Indiana border northeast of Butler, Indiana. (120 miles located in the Lake Michigan Basin)	None
Lake County Porter County LaPorte County St. Joseph County	Wolverine Pipeline Company	14-inch pipeline from East Chicago to the Indiana border north of South Bend. (50 miles located in the Lake Michigan Basin)	None

APPENDIX V continued

LOCATION	INDUSTRY	TYPE OF FACILITY	MEASURES NEEDED TO PREVENT THE ESCAPE OF THIS MATERIAL
PIPELINES			
Lake County Porter County LaPorte County St. Joseph County	Standard Oil Company	12-inch pipeline from Whiting to the Indiana border north of Elkhart (60 miles located in the Lake Michigan Basin)	None
Lake County Porter County LaPorte County St. Joseph County	Texas Cities Service Pipeline Company	6-inch pipeline from East Chicago to the Indiana border north of South Bend (65 miles located in the Lake Michigan Basin)	None
Lake County Porter County LaPorte County	Muskegon Pipeline Corporation	10-inch pipeline from the Indiana border east of Michigan City to Griffith	None
Lake County	Badger Pipeline Company	12-inch (5 miles) pipeline from East Chicago to the Indiana border west of Hammond	None
Lake County	Texas Pipeline Company	6-inch (3 miles) pipeline from East Chicago to the Indiana border west of Hammond	None
Lake County	Texaco - Cities Service Pipeline Company	16-inch (8 miles) pipeline from the Indiana border west of Dyer to Griffith	None

APPENDIX V continued

LOCATION	INDUSTRY	TYPE OF FACILITY	MEASURES NEEDED TO PREVENT THE ESCAPE OF THIS MATERIAL
PIPELINES			
Lake County	Service Pipeline Company	8-inch (5 miles) pipeline from the Indiana border west of Munster to Griffith	None
Lake County	Service Pipeline Company	14-inch (12 miles) pipe line from the Indiana border west of Dyer to Whiting	None
Lake County	Service Pipeline Company	18-inch (12 miles) pipeline from the Indiana border west of Dyer to Whiting	None
Lake County	Standard Oil Company	10-inch (13 miles) pipeline from East Chicago to the Indiana border west of Dyer	None
Lake County	Standard Oil Company	8-inch pipeline from East Chicago to Indianapolis (15 miles located in the Lake Michigan Basin)	None
Lake County	Sinclair Pipeline Company	8-inch (14 miles) pipeline from East Chicago to the Indiana border west of Dyer	None

APPENDIX V continued

LOCATION	INDUSTRY	TYPE OF FACILITY	MEASURES NEEDED TO PREVENT THE ESCAPE OF THIS MATERIAL
PIPELINES			
Lake County	Shell Oil Company, Inc.	14-inch (8 miles) pipeline from Hammond to the Indiana border west of Crown Point	None
Lake County	The Buckeye Pipeline Company	8-inch pipeline from the Indiana border east of Decatur, Indiana to Whiting (18 miles located in the Lake Michigan Basin)	None
Lake County	The Buckeye Pipeline Company	8-inch pipeline from Griffith to the Indiana border east of Decatur, Indiana (17 miles located in the Lake Michigan Basin)	None
Lake County	The Buckeye Pipeline Company	10-inch (10 miles) pipeline from Griffith to East Chicago	None
Lake County	The Buckeye Pipeline Company	6-inch (3 miles) pipeline located in Griffith	None
Lake County	Texaco - Cities Service Pipeline Company	12-inch (10 miles) pipe line from the Indiana Border west of Munster to East Chicago	None
Lake County	Texaco - Cities Service Pipeline Company	18-inch (5 miles) pipeline from Griffith to East Chicago	None

APPENDIX V continued

LOCATION	INDUSTRY	TYPE OF FACILITY	MEASURES NEEDED TO PREVENT THE ESCAPE OF THIS MATERIAL
PIPELINES			
Lake County	Texaco - Cities Service Pipeline Company	6-inch (3 miles) pipeline in East Chicago	None
Lake County	Phillips Petroleum Company	Two 8-inch (12 miles) pipelines from East Chicago to the Indiana border west of Crown Point	None
Porter County Lake County	Tecumseh Pipeline Company	20-inch pipeline from the Indiana border east of Auburn, Indiana to Munster (70 miles located in the Lake Michigan Basin)	None
TERMINALS - PUMPING STATION - TANK FARMS			
Griffith	Buckeye Pipeline Company Muskegon Pipeline Corporation Service Pipeline Company	Pumping station, terminal, and tank farm	None
Schererville	Sinclair Pipeline Company	Pumping Station	None
Schererville	Tecumseh Pipeline Company	Pumping Station	None
Wheeler, Porter County	Sinclair Pipeline Company	Pumping Station	None
Mill Creek, LaPorte County	Sinclair Pipeline Company	Pumping Station	None
South Bend	Sinclair Pipeline Company	Terminal and tank farm	None

APPENDIX V continued

LOCATION	INDUSTRY	TYPE OF FACILITY	MEASURES NEEDED TO PREVENT THE ESCAPE OF THIS MATERIAL
Granger, St. Joseph Co.	Standard Pipeline Company	Terminal, pumping station and tank farm	None
Elkhart	Sinclair Pipeline Company	Pumping Station	None
Kendallville	Sinclair Pipeline Company	Pumping Station	None
East Chicago	American Oil Company	Terminal	Increased care in handling
East Chicago	Sinclair Refining Company	Terminal	Increased care in handling
East Chicago	Cities Service Oil Company	Terminal	Increased care in handling
East Chicago	Texaco	Terminal	Increased care in handling
East Chicago	Shell Oil Company	Terminal	Increased care in handling
East Chicago	Clark Oil Company	Terminal	Increased care in handling

APPENDIX VI

LAKE MICHIGAN BASIN
INDUSTRIES HANDLING SIGNIFICANT AMOUNTS OF OIL AND/OR HAZARDOUS MATERIALS

LOCATION	INDUSTRY	HAZARD	MEASURES NEEDED TO PREVENT ESCAPE OF MATERIAL
Whiting	Union Carbide Corporation	Hydrocarbon chemicals	None
East Chicago	E. I. duPont deNemours, Inc.	Acids and herbicides	None - herbicides handling area is completely isolated
Gary	U. S. Steel Corporation	Cyanide, Acids and oils	Increased care in handling
East Chicago	Inland Steel Company	Cyanide, Acids and oils	Increased care in handling
East Chicago	Youngstown Sheet & Tube Company	Cyanide, Acids and oils	Increased care in handling
Portage	Midwest Steel Division National Steel Corporation	Acids and oils	None
Chesterton	Bethlehem Steel Corporation	Acids and oils	None

MR. STEIN: Any comments or questions of Indiana?

I would like to highlight one point where a recommendation was made for a modification, and this is in their first point, the last sentence.

MR. MILLER: Correct.

MR. STEIN: "It is recommended that the States determine where phosphorus removal is required as long as 80 percent reduction of municipal industrial sources is obtained within the drainage basin of the respective State."

This means that on the basis of the whole drainage area, as I understand it, the States will determine how they can get an 80 percent reduction based on an entire drainage area. Now, the reason for this, and we have adopted a similar approach in Lake Erie, is this:

Very often in dealing with the pounds of phosphate coming out of a drainage area, it is often much more productive to get perhaps even the one or two percent increase in a large city than to worry about getting top removal in a small town of, say, five or six hundred people. I think this is obvious if you are going for 80 or 90 percent removal in one of your major cities, you can accomplish much more than trying to get 90 percent in a small town and being sure they are going to operate that in terms of removal. The proposal is that that 80 percent reduction, which we are looking for, be accomplished on a drainage basin within the State and the State be given the discretion and leeway to make the judgment on how it accomplishes this.

If this is appropriate, the Conferees should keep this in mind, because we probably will take this up at the end to see if that is acceptable to you--to give the States more flexibility in accomplishing the same result that we are looking for in phosphate removal.

Are there any other comments or questions?

If not, thank you very much, Mr. Miller, for your statement.

We will now call on Illinois. Mr. Klassen.

STATEMENT BY CLARENCE W. KLASSEN
TECHNICAL SECRETARY, ILLINOIS SANITARY
WATER BOARD, CHICAGO, ILLINOIS

MR. KLASSEN: Mr. Chairman, Conferees, ladies and gentlemen.

My presentation will be a summary of the report that has been given to the Conferees. With your permission, Mr. Chairman, I would like to give you the highlights of this, but have the other in the record.

MR. STEIN: Without objection, that will appear in the record as if read.

MR. KLASSEN: A brief statement and introduction to remind some of you of the rather unique position that Illinois is in.

All of the territory in Illinois tributary to Lake Michigan is situated in two sanitary districts, that is all the territory under the jurisdiction of this Conference: Cook County in the Chicago Sanitary District, which, as you know, diverts the wastes away from the lake down the Illinois waterway to the Mississippi, and the other in the North Shore Sanitary District.

This Conference adopted 26 recommendations at its January-March 1968 meeting, and the following is a summary of the actions taken by the State of Illinois with respect to these 26 recommendations.

1. To provide municipal waste treatment to comply with approved water quality standards and to provide 80 percent reduction in total phosphorus, all by December 1972. All municipal sewage effluent discharges to Lake Michigan in Illinois are within the North Shore Sanitary District. Plans have been made by the District to divert all effluents out of the Lake Michigan watershed and provide adequate treatment prior to their discharge to the outlet stream, in this case the Des Plaines River. A 35 million dollar bond issue has been authorized by the voters. Initial construction is scheduled to start during 1969, with completion scheduled in 1972 at an estimated total cost of 60 million dollars.

I have asked Raymond Anderson, the manager of the District, to very briefly outline just some of the high points of this quite dramatic move on the part of the District and the citizens in the District.

Ray.

STATEMENT BY RAYMOND E. ANDERSON
GENERAL MANAGER, NORTH SHORE SANITARY DISTRICT, WAUKEGAN, ILLINOIS

MR. ANDERSON: Thank you, Mr. Klassen.

The North Shore Sanitary District is located within Lake County, Illinois, and is bounded on the north by the Wisconsin State line, on the south by the Cook County line. It is approximately three to six miles wide, and since this map was prepared the District has annexed the Village of Gurnee in this area (indicating). Otherwise, all that is within the yellow is the present area served by the North Sanitary District.

Beginning at the north our comprehensive plan provides for the extension of intercepting sewers into new area and the augmentation of an existing interceptor from Winthrop Harbor and Zion down to Waukegan.

At Waukegan we propose to maintain the existing secondary treatment plant for operation and to treat Winthrop Harbor, Zion, Illinois Beach, State Park and the City of Waukegan sewage. Then it will be pumped through force mains and a gravity sewer out to the Village of Gurnee, where a tertiary treatment plant will be constructed before discharge to the Des Plaines River.

The upper end of the Skokie Valley will be served by and is served by an intercepting sewer down through the valley that terminates now at the Cook County line where we have the Clavey Road plant.

But the upper reaches of that valley will be served by this interception sewer and then pumped back to Gurnee for a secondary treatment plant, so that the Gurnee and Waukegan industrial park, the Village of Gurnee and the upper reaches of the valley will be treated secondary and then tertiary before discharge to the Des Plaines River.

At North Chicago we will maintain the existing secondary treatment plant for pretreatment purposes and then pump the effluent over to the pumping station in the Skokie Valley, north up to Gurnee for the treatment which I have already described.

The existing treatment plants of Lake Bluff, Lake Forest and three small ones in Highland Park that are along the lakefront will be treated at the

Clavey Road plant in Highland Park by secondary treatment and an oxidant pond and then discharged to the Des Plaines River. The Lake Bluff plant will have a pumping station which will discharge all of the sewage and the stormwater too. Since we have some combined sewers in Lake Bluff, we have stormwater entering the system. We also have stormwater at the other communities through illegal connections or lack of stormwater facilities. But the stormwater will be pumped, along with the sewage, over to the Skokie Valley or to the middle fork of the north branch of the Chicago River for discharge to the Clavey Road plant. Lake Forest also will have a pumping station with discharge for all of the sewage plus the stormwater to the Skokie Valley interceptor.

The Park Avenue and Ravine Drive plants will be carried by an intercepting sewer along the beach to the Cary Avenue site, where a pumping station will be constructed and then taken over to the Clavey Road plant for treatment.

MR. KLASSEN: Thank you, Ray.

MR. STEIN: In other words, all the wastes will not go into Lake Michigan?

MR. KLASSEN: That is right, Mr. Chairman. Illinois will be in the rather singular position of being the only State--and I guess God intended it this way because of the geography--where all of the wastes in Illinois will be removed from Lake Michigan and given adequate treatment and taken out of the watershed by 1972.

MR. STEIN: Well, that is very good. You know, Mr. Klassen, I think this is wonderful for Lake Michigan. However, I wonder if next time I go down to New Orleans--you can come down with me and have a real good time and listen to the people in Louisiana. This is like a seamless web, and the problem is once we deal with the problem in one place we begin to get repercussions in the other. Of course the people down at the lower end of the Mississippi River are getting more and more distressed about having all these wastes coming down from the upstream States.

MR. KLASSEN: I may say, Mr. Chairman, when Memphis, Baton Rouge, and New Orleans provide tertiary treatment for their wastes, then we are ready to hear their complaint, but not until then. (Laughter.)

MR. STEIN: Well, I tell you, they may be providing secondary soon, and the complaints are coming forward.

MR. KLASSEN: I am glad to know that they may be.

STATEMENT BY CLARENCE W. KLASSEN
TECHNICAL SECRETARY, ILLINOIS SANITARY WATER BOARD, CHICAGO, ILLINOIS
(CONTINUED)

MR. KLASSEN: Recommendation 2. Industries to provide adequate treatment prior to the discharge by 1972. A list of industries:

Johns Manville Corporation of Waukegan has provided a closed system. There is no discharge to the lake and they are now in compliance.

Outboard Marine Corporation at Waukegan, that includes the Johnson Motors: Effluent from oil interceptors discharges to Waukegan Harbor through a ditch to the lake, but it meets the effluent standards. Plating wastes are discharged to the North Shore Sanitary

District treatment works.

Commonwealth Edison, Waukegan: Cooling water discharges are in compliance with temperature standards.

Abbott Laboratories, North Chicago: All sanitary wastes go to the North Shore Sanitary District. Industrial waste treatment works improvements currently under construction are scheduled to be completed and in full operation by April 1969, designed to meet State effluent standards. Also plans to divert effluent away from the lake to the North Shore Sanitary District facilities are being studied.

U. S. Steel Corporation, Waukegan Works: Sanitary wastes are treated by the North Shore Sanitary District. Concentrated pickle liquor waste is hauled to a disposal well at Gary, Indiana.

MR. STEIN: How did you do that? (Laughter.)

MR. KLASSEN: Poole always says they solve all our problems. We wanted to keep them honest.

MR. POOLE: That is the only way he could solve his problem, Mr. Chairman, interstate cooperation.

MR. KLASSEN: This is one thing that the

Federal Government hasn't caught on to, Poole. This is an interstate transport of industrial wastes.

MR. POSTON: Give us a little time, Clarence.

(Laughter.)

MR. KLASSEN: Current projects for the separation and collection of oil and separation and treatment of pickle liquor rinses are scheduled to be completed during 1969 with the exception of one outfall, that is June 1970.

Chicago Hardware and Foundry: Sanitary wastes go to the North Shore Sanitary District. Industrial waste flow, containing some minor amounts of cyanide, chromium, iron and copper, is discharged to Pettibone Creek about half a mile from the lake. In-plant modifications and process changes are being made to eliminate all pollutional discharges. This will be completed prior to 1972.

Fansteel Corporation is in the same situation. All of their wastes go to North Shore, and they are making in-plant changes and processes to eliminate all pollutional wastes going to the lake prior to 1972. These include some neutralized iron, copper and nickel wastes.

U. S. Steel Corporation, South Works, Chicago: Discharges cooling water and treated process water to the lake. Several improvement projects were completed by December 31, 1968. Quality of effluents discharged to the lake and to the Calumet River, which can under certain conditions flow into the lake, were not considered satisfactory by the Lake Michigan-Calumet Area Enforcement Conference and on January 29, 1969, this was referred to the Secretary of the Interior for action.

3. Submit list of municipalities and industries discharging wastewater to the lake. This was submitted to the Federal Water Pollution Control regional office June 6, 1968.

Recommendation 4 relative to providing continuous disinfection throughout the year for all municipal plant effluents. This has been provided since May 1968 by the North Shore Sanitary District which operates all municipal plants in Illinois tributary to Lake Michigan.

C. W. Klassen

5, regarding unified collection systems to be encouraged. All urban areas in Illinois in the Lake Michigan watershed are served by the North Shore Sanitary District or the Metropolitan Sanitary District of Greater Chicago.

6, the adjustable overflow regulating devices for combined sewers. Combined sewers with three overflow structures serve the very limited areas in Waukegan and Lake Bluff. All of the other municipal sewers carry sanitary and industrial waste. The current project by the North Shore Sanitary District provides for the elimination of all of these overflows, as described by Mr. Anderson.

7, the separation of the combined sewers is covered by the previous one.

8. Encourage the discharge of treatable industrial wastes to municipal sewer system: Abbott Laboratories, Outboard Marine Corporation, Fansteel, Chicago Hardware, U. S. Steel Waukegan Works, are conferring with the North Shore Sanitary District regarding the discharge of pretreated industrial wastes to the District facilities.

9. The provision of continuous disinfection of industrial wastes: Abbott Laboratories pasteurizes its effluent. No other industrial effluents contain pathogenic or indicator organisms.

10. Regarding nuclear discharges and thermal pollution: Illinois has a representative who was appointed on the committee that participated in the preparation of a report which is to be submitted to the Conferees.

11. Dumping of polluted material into Lake Michigan to be prohibited: Senate Bill 1794 passed by the Illinois General Assembly, approved by the Governor on October 30, 1967, stipulates that only non-pollutional material can be deposited in the lake and that permits to dump can be issued by the Department of Public Works and Buildings only upon concurrence by the Sanitary Water Board that pollution will not be caused. Such a policy has and is being followed.

Regarding the removal of dead alewife, the Department of Conservation of Illinois has participated in this cooperative Federal-Four States program.

13. Wastes from watercraft. Rules and

Regulations, Sanitary Water Board 19, entitled, "Disposal of sewage and wastes from watercraft," was adopted by the Illinois Sanitary Water Board July 2, 1968, and will become effective January 1, 1970. Said rules and regulations conform to the uniform standards agreed upon by representatives of the Conferees who met subsequent to the enforcement Conference first session.

The City of Chicago has, during the 1968 boating season, enforced its ordinance prohibiting discharge of sewage from watercraft unless adequately treated. The Chicago Park District has cooperated by requiring watercraft to be in compliance with this ordinance prior to the issuance of permits for mooring space in district harbors. The district has also provided pump facilities for removing the material from the holding tanks.

Following my presentation, Mr. Pavia of the Chicago Department of Water and Sewers, is going to give a brief report on their experiences with this ordinance and its enforcement.

14. To promote use of area-wide sewage facilities and discouraging small treatment plants and

eliminating septic systems: All of the Illinois area in the Lake Michigan watershed is within the North Shore Sanitary District or the Metropolitan Sanitary District of Greater Chicago. Only minor areas are not served by a public sewer system and treatment works. Continuing action is being taken to serve these areas with public facilities.

15. Pesticides committee and regulation of commercial applications: Illinois representative was appointed and has attended all meetings of the committee and has participated in the report which is to be submitted to the Conferees.

Illinois statutes provide for the Department of Agriculture to license and to regulate custom application of pesticides. At the present time there are several bills in the Illinois Legislature to regulate and to prohibit the use of chlorinated hydrocarbons, including DDT. They are currently being considered in the State Legislature and we anticipate these will be passed during this current session.

Regarding the prevention of pollution from agricultural land use, this was assigned by the Conferees to the Department of Agriculture.

Committee on monitoring: Illinois representative was appointed, has attended all meetings of the committee and has participated in the preparation of the report to be submitted to the Conferees.

In addition, during 1968, Illinois Sanitary Water Board staff monitored Lake Michigan beach and offshore water. Samples were collected at 31 beaches and from the intake at 12 water filtration plants. The results of the analyses were evaluated on the basis of the recently established, very stringent, "Water Quality Standards for Lake Michigan," adopted by the Illinois Sanitary Water Board and approved by the United States Department of the Interior January 27, 1968.

The following conclusions are presented which reflect the first evaluation of water quality at the Illinois beaches based upon these new standards. They illustrate the need for upgrading treatment facilities or the removal of effluent from Lake Michigan.

These are the summary of the conclusions:

Bacterial averages exceeded the criteria limits more than 50 percent of the time at 12 beaches, with the poorest quality water at beaches near the Lake County treatment plant outfalls and the major recreational boating harbors. And this confirms our contention, and of course the action by the North Shore Sanitary District, in the need for controlling all of the combined sewer overflows, which are responsible in a great measure for these results, in the overloaded plants and also for the control of wastes from watercraft contributed by the major recreational boat harbors.

Shore waters on all beaches failed to meet the criteria for phosphates and surfactants.

Beach shore water met temperature, phenol and cyanide criteria.

The ammonia nitrogen criteria for shore waters was exceeded at eight beaches in or near Lake County and at one Chicago beach.

I might say that a complete report on all of these details will be ready for distribution next week.

While offshore water met the coliform bacteria criteria for single samples, the annual average criteria of 200 per 100 milliliter was exceeded at four water works intakes. The criteria for fecal streptococci bacteria was met except once or twice in each series of 17 samples collected from the water works intakes.

The ammonia nitrogen annual average criteria was exceeded at all intakes except at the Chicago South filtration plant.

Following my presentation, Mr. Vaughn of the Chicago Water Department, is going to give a very brief resume of the water quality as reflected in his analyses or their analyses at their water works intakes.

The phosphate and iron annual average criteria for open waters was exceeded at all intakes.

Criteria for the following determinations were met by samples from practically all of the water plant intakes: Phenol-like substances, cyanide and chloride sulfate.

18. Preparation of inventory of potential oil and other hazardous material spills. This was submitted to the regional office, Federal Water Pollution Control Administration July 31, 1968.

Water quality analyses, including planktonic algae counts, by water filtration plants in Illinois, Evanston, Chicago Central District, the South District plant. Illinois has recommended that this item be coordinated and included with the program developed by the monitoring committee. This has been done by the monitoring committee.

On the monitoring by the Coast Guard, Illinois supports this recommendation.

Discharge of visual oil to Lake Michigan to be eliminated: Suit has been instituted by MSDGC against U. S. Steel South Works. There are no other discharges requiring action known at this time.

22. Research: State will participate to extent that finances and personnel permit.

23. Strengthen Federal legislation for control of oil pollution on Lake Michigan: Illinois supports recommendation.

24. Full appropriation of Federal grant authorizations be made by Congress: Illinois supports recommendation.

25 and 26. Relate to reconvening of the Conferees.

There is one other item that just happened. One week ago today there was introduced in the Congress

House Bill 7011 by Congressman McClory, the North Shore, and this is an amendment to the Federal Water Pollution Control Act, additional grants to prevent the pollution of Lake Michigan. The substance of it is this:

The Secretary is authorized to make grants to any municipality, which, of course, includes sanitary districts, for the construction of necessary facilities to remove from the Lake Michigan watershed and to provide adequate treatment for pollutional wastes now entering Lake Michigan. The grants in these sections shall be made in addition to and not in the place of any grants which have or will be made. There is authorized to be appropriated 25 million dollars.

(The following is the document submitted by Mr. Klassen:

ILLINOIS SANITARY WATER BOARD

PRESENTATION

LAKE MICHIGAN - FOUR STATE CONFERENCE.

February 25, 1969

Chicago, Illinois

By: C. W. Klassen, Technical Secretary

The "Summary of Conference (First Session), Pollution of Lake Michigan and its Tributary Basin (Wisconsin - Illinois - Indiana - Michigan)", issued subsequent to the several meetings held by the Conferees during January-March 1968, presented 26 Recommendations adopted by the Conferees representing the Federal Government and the four Lake Michigan States.

The following action has been taken by the State of Illinois with respect to these recommendations:

1. Provide municipal waste treatment to comply with approved water quality standards and to provide 80 percent reduction in total phosphorus, all by December 1972. All municipal sewage effluent discharges to Lake Michigan in Illinois are within the North Shore Sanitary District. Plans have been made by the District to divert all effluents out of the Lake Michigan watershed and provide adequate treatment prior to their discharge to the outlet stream. A $35,000,000 bond issue has been authorized. Initial construction is scheduled to start during 1969, with completion scheduled in 1972.

2. Industries to provide adequate treatment prior to discharge to lake by 1972.

A. Johns Manville Corporation, Waukegan: has provided closed system--no discharge to lake--in compliance.

B. Outboard Marine Corporation, Waukegan (includes Johnson Motors): effluent from oil interceptors discharges to Waukegan Harbor and through ditch to lake - meets effluent standards. Plating wastes are discharges to North Shore Sanitary District treatment works.

C. Commonwealth Edison Company, Waukegan: Cooling water discharge is in compliance with temperature standards.

D. Abbott Laboratories, North Chicago: Sanitary wastes treated by North Shore Sanitary District. Industrial waste treatment works improvements currently under construction are scheduled to be completed and in full operation by April 1969 - designed to meet State effluent standards. Plans to divert effluent away from lake to North Shore Sanitary District facilities are being studied.

E. U. S. Steel Corporation, Waukegan Works: Sanitary wastes treated by North Shore Sanitary District. Concentrated pickle liquor waste is hauled to disposal well at Gary. Current projects for separation and collection of oil and separation and treatment of pickle rinses are scheduled to be completed during 1969 (except for one outfall - June 1970).

F. Chicago Hardware and Foundry: Sanitary wastes treated by North Shore Sanitary District. Industrial waste flow, contains minor amounts of cyanide, chromium, iron and copper, is discharged to Pettibone Creek about 1/2 mile from the lake. In-plant modifications and process changes being made to eliminate pollutional discharges; work to be completed prior to 1972.

G. Fansteel Metallurgical Corporation: Sanitary wastes treated by North Shore Sanitary District. Industrial waste flow contains neutralized waste with iron, copper and nickel, is discharged to Pettibone Creek about 1/2 mile from lake. In-plant modifications and process changes being made to eliminate pollutional discharges; work to be completed prior to 1972.

H. U. S. Steel Corporation, South Works (Chicago): Discharges cooling water and treated process water. Several improvement projects were completed by December 31, 1968. Quality of effluents discharged to lake and to the Calumet River (which can under certain conditions flow into lake) were not considered satisfactory by Lake Michigan-Calumet Area Enforcement Conference January 29, 1969; referred to Secretary of Interior for action.

3. Submit list of municipalities and industries discharging wastewater to the Lake Michigan basin. List was prepared and submitted to the Federal Water Pollution Control Administration regional office in Chicago on June 6, 1968.

C. W. Klassen

4. Provide continuous disinfection throughout year for all municipal waste treatment plant effluents: Has been provided since May 1968 by North Shore Sanitary District which operates all municipal plants in Illinois tributary to Lake Michigan.

5. Unified collection systems to be encouraged: All urban areas in Illinois in the Lake Michigan watershed are served by the North Shore Sanitary District or the Metropolitan Sanitary District of Greater Chicago.

6. Install adjustable overflow regulating devices on existing combined sewer systems: Combined sewers with three overflow structures serve very limited areas in Waukegan and Lake Bluff. All of the other municipal sewers, tributary to Lake Michigan, carry sanitary and industrial waste. The current project by the North Shore Sanitary District provides for elimination of these overflows.

7. Separate all combined sewers: See item No. 6.

8. Encourage discharge of treatable industrial wastes to municipal sewer system: Abbott

Laboratories pasteurizes effluent - no other industrial effluents contain pathogenic or indicator organisms.

10. Appoint special committee on Nuclear Discharges and Thermal Pollution Aspects of Power Plants and Reactors: Illinois representative was appointed, has participated in preparation of report which is to be submitted to the Conferees.

11. Dumping of polluted material into Lake Michigan to be prohibited: Senate Bill 1794 passed by the Illinois State Legislature, approved by the Governor on October 30, 1967, stipulates that only non-pollutional material can be deposited in lake and that permits to dump can be issued by the Department of Public Works and Building, only upon concurrence by the Sanitary Water Board, that pollution will not be caused. Such policy has and is being followed.

12. Removal of dead alewives: The Illinois Department of Conservation has participated in the cooperative Federal-four States program.

13. Watercraft wastes: Rules and Regulations, SWB-19, "Disposal of sewage and wastes from watercraft," adopted by the Illinois Sanitary Water Board

July 2, 1968, will become effective January 1, 1970. Said Rules and Regulations conform to uniform standards agreed upon by representatives of the Conferees who met subsequent to the Enforcement Conference First Session.

The City of Chicago has, during the 1968 boating season, enforced their ordinance prohibiting discharge of sewage from watercraft unless adequately treated. The Chicago Park District has cooperated by requiring watercraft to be in compliance with this ordinance prior to issuance of permits for mooring space in district harbors. The district has also provided pump-out facilities for holding tanks.

14. Promote use of area-wide sewage facilities, discourage small treatment plants and eliminate septic systems: All of the Illinois area in the Lake Michigan watershed is within the North Shore Sanitary District or the Metropolitan Sanitary District of Greater Chicago. Only minor areas are not served by a public sewer system and sewage treatment works. Continuing action is being taken to serve these areas with public facilities.

15. Pesticides committee and regulation of commercial applications: Illinois representative was appointed, has attended all meetings of committee and has participated in preparation of report which is to be submitted to Conferees. Illinois has Statute providing for the State Department of Agriculture to license and to regulate custom application of pesticides. Several bills to regulate or to prohibit use of chlorinated hydrocarbon, including DDT are currently being considered by the State Legislature.

16. Prepare report on programs to prevent pollution from agricultural land use: Assigned by Conferees to U. S. Department of Agriculture.

17. Committee on Monitoring: Illinois representative was appointed, has attended all meetings of the committee and has participated in preparation of report which is to be submitted to the Conferees.

During 1968, Illinois Sanitary Water Board staff monitored Lake Michigan beach and offshore water. Samples were collected at 31 beaches and from the intake at 12 water filtration plants. The results of the analyses were evaluted on the basis of the recently established, very stringent, "Water Quality Standards for Lake Michigan - Rules and Regulations SWB-7," adopted by the Illinois Sanitary Water Board and approved by the U. S. Department of Interior January 27, 1968.

The following general conclusions are presented which reflect the first evaluation of water quality at the beaches based on these new standards. These illustrate the necessity of upgrading treatment facilities or removal of effluent from Lake Michigan.

A. Bacterial averages exceeded the criteria limits more than 50 percent of the time at 12 beaches with poorest quality water at beaches near the Lake County treatment plant outfalls and major recreational boat harbors.

B. Shore water at all beaches failed to meet criteria for phosphates and surfactants.

C. Beach shore water met temperature, phenol-like substances and cyanide criteria.

D. The ammonia nitrogen criteria

for shore water was exceeded at eight beaches in or near Lake County and at one Chicago beach.

E. While offshore water met the coliform bacteria criteria for single samples, the annual average criteria of 200/100 ml was exceeded at four intakes. The criteria for fecal streptococci bacteria was met except once or twice in each series of 17 samples collected from each intake.

F. The ammonia nitrogen annual average criteria was exceeded at all intakes except at the Chicago South filtration plants.

G. The phosphate and iron annual average criteria for open water was exceeded at all intakes.

H. Criteria for the following determinations were met by samples from practically all of the water plant intakes: phenol-like substances cyanide and chloride sulfates.

18. Prepare inventory of potential oil and other hazardous material spill sites: Submitted to

regional office, FWPCA, on July 31, 1968.

19. Water quality analyses (including planktonic algae counts) by water filtration plants (in Illinois, Evanston, Chicago Central District and Chicago South District.) Illinois has recommended that this item be coordinated and included with the program developed by the monitoring committee. This has been done by the monitoring committee.

20. Monitoring by Coast Guard: Illinois supports recommendation.

21. Discharge of visual oil to Lake Michigan to be eliminated: Suit has been instituted by MSDGC against U. S. Steel South Works. There are no other discharges requiring action known at this time.

22. Research: State will participate to extent that finances and personnel permit.

23. Strengthen Federal legislation for control of oil pollution on Lake Michigan: Illinois supports recommendation.

24. Full appropriation of Federal grant authorizations be made by Congress: Illinois supports recommendation.

25. and 26. Relate to reconvening of the Conferees.

MR. STEIN: Are there any questions or comments?

Mr. Poston.

MR. POSTON: I have about three questions, Clarence.

The first one is, I note in the paper there has been a problem with taste and odors near North Chicago in the recent time and even today, evidently, and I wondered if you could comment on the source of this and whether or not the works that are in operation will handle this or what is the situation?

MR. KLASSEN: We can't comment unless we know what is causing it and we don't know what is causing it. I don't know as this pertains to this, but periodically up there there are tastes and odors caused by--I will try to pronounce it--actinomycetes, which is a growth in the lake and which is included in effluents and in some industrial discharges.

This isn't by way of answering your

question because we do not know the source of these. Periodically this happens, and if and when we know what is causing it, you can be assured, if it is within the jurisdiction of the technical knowledge of the Illinois Sanitary Water Board, action will be taken.

But there are conditions inherent to Lake Michigan that periodically cause these. I don't know what causes these and if there is anybody here that wants to comment on it, I would sure welcome it.

What is your second question?

MR. POSTON: I am not certain that I heard all of Mr. Anderson's comments relative to the stormwater discharges. Is it the plan to discharge all stormwater from combined sewers in the communities in Illinois away from the lake?

MR. KLASSEN: Yes.

MR. POSTON: They will all be taken care of?

MR. KLASSEN: Yes.

MR. POSTON: My third question has to do with the absence of any comment relative to some of the steel companies and other dischargers into the Calumet

River. It was agreed by the Conferees that they were in the Calumet enforcement area since at times they do discharge to the lake. And since they have not been eliminated from that enforcement action, I wondered why, in light of this, the particular polluters in that area were not mentioned in your list of industries?

MR. KLASSEN: There are two good reasons. It is my understanding that these industries are included under the jurisdiction of the Illinois-Indiana Enforcement Conference and not under this jurisdiction.

The second reason is that by the ruling of the Conferees of that Conference it was ruled that these industries are under the jurisdiction of the Federal Government.

And, therefore, I would say if you want this report, we will expect it from you since they are under your jurisdiction.

MR. STEIN: Are there any other comments or questions?

MR. POSTON: Well, I think, then, I ought to ask the Chairman how he--I think at the last meeting it was my understanding that these industry dischargers to the Calumet River were a part of this Conference as well, and I think probably I would be interested in hearing your ruling. Also Indiana's were included and I wondered whether we should eliminate them also.

MR. STEIN: I don't think they were eliminated, but there is a recommendation before the Secretary, and we covered it in the last Conference. Now, I don't know that we are not going over ground again that we have gone over in the past month and this was covered, we have a recommendation from the Conferees being considered by the Secretary now. If you fellows want to go through a replay with the four States of what we did before, just a few weeks ago, it is all right with me.

But as far as I can see, we are moving ahead with the Federal-State program vis-a-vis those discharges as rapidly as the law will permit.

MR. KLASSEN: I think Mr. Poston raised an interesting question. I would like to hear his expression.

Do you consider the Calumet River under the jurisdiction of the State of Illinois or the Federal

Government? If it is under the State of Illinois, I will report it. If it is not, then it is your responsibility. I would like to have you answer this.

MR. POSTON: Well, first off, the previous meeting, the Recommendation No. 16--Conclusion No. 16 says that, "The Federal enforcement actions already in effect on the Menominee River area and the Calumet River area are supplemented but not superseded by this Conference." And I really regard these areas as a part of this Conference.

MR. KLASSEN: You didn't answer my question. Are they under the jurisdiction of Illinois or the Federal Government? I think this depends on--

MR. POSTON: I would say both. I would say both, Mr. Klassen. I think--

MR. KLASSEN: They can't be under both.

MR. POSTON: I think that this Conference here is the first stage of any enforcement action and I think it is reasonable people that are sitting here around this table and coming to agreements. I think it is later stages in any enforcement actions that we have where the Federal Government takes over, whether it is turned over to the District Court. That is when I would say--

MR. KLASSEN: It is my understanding that the Federal Government has taken over the Calumet River by referring Republic Steel, U. S. Steel on the Calumet River to the Secretary of the Interior. Now, how can the State of Illinois come in now and say it is our jurisdiction, we are going to report? I don't follow you at all. You are going to have to be consistent.

MR. POSTON: We might use a different example, then. Wisconsin Steel, which is on that river, was not listed here. Wisconsin Steel is on the Calumet River and the schedule is--

MR. KLASSEN: Under the Federal enforcement, because you were one that voted, I will remind you, you voted to extend the deadline for Wisconsin Steel beyond the deadline that the State of Illinois had set, therefore not recognizing our jurisdiction. I don't want to prolong this, but we can't get complicated here by one set of Conferees taking one action and another set here expecting another one. We have got to be consistent. If they are under the Illinois-Indiana Enforcement

Conference, let's leave them there. If they are under here, that is something for the Chairman to rule on.

MR. STEIN: Let me exercise the prerogative of the Chairman here and let you fellows both pick on me, because I think if we are really going to deal with pollution, the notion is not to get bogged down in these jurisdictional matters.

If there was anything to be gained further than what we have done here a few weeks ago with those sources, I would say fine and I am ready to take on any jurisdictional operation. But unless we can perceive that we can move this case any further, maybe we are spinning our wheels and I think we have moved that as far as we can go.

As far as jurisdiction is concerned, let me make a very short statement on that. I think the Federal law was conceived that in these interstate waters we do have concurrent jurisdiction, that is both the State and the Federal Government have jurisdiction. It is not like in some other fields where it is contended when the Federal laws pass, for example, in probably the atomic energy field or nuclear energy field or some aspects of the labor field, when the Federal Government takes action the States are supplanted. I think the law is clear that the primary rights and responsibilities of pollution control rest with the States and in any event we have concurrent jurisdiction. I think, for example, in Michigan, Milt Adams and Nick Olds have worked on that question, and the other States worked it out very, very carefully.

Now, in order to exercise this concurrent jurisdiction or enforcement jurisdiction, not supplanting the State jurisdiction, the Federal Government can move on its own initiative when, on the basis of reports, surveys or studies, the Secretary of the Interior has reason to believe that pollution in one State is endangering the health or welfare of persons in another State. Even when we move there, that does not mean that we do not refer the case back for its day-to-day action to the States and that is why we are getting the reports here.

Where we deal with a navigable water and there is intrastate pollution, when the governor of a State asks us to come in on that matter, we can again begin exercising our concurrent jurisdiction.

Now, as far as I know, this remains a question wherein both the Calumet River case and the Lake Michigan case are based on our interstate jurisdiction not our intrastate jurisdiction. Now, if any of the governors of any of the four States want to ask us in on an intrastate operation, of course, the Secretary would take that. We have not had that request yet.

But I again say, this is a jurisdictional matter. I don't know, in dealing with the cooperation we are getting here, that that necessarily is the most relevant operation. What we would like to do is get pollution cleaned up from all these sources. Now, again as far as I know--and I have been talking to the industries and the State officials and the municipal officials--except for the case that Indiana mentioned where they had to refer one company to court action, all the other industries and cities are going forward with this program. The question is--what may have happened is a deadline may have been missed. But there has been and there may be good reason for that or reasons you don't consider sufficient.

But the question here is not so much that someone is saying they are not going to clean up, because everyone is agreed on the program. The question is when. Some of the industries have argued that it is a physical impossibility and they need more time, and that includes the industries on the Calumet River. Some of the cities say they need Federal funds but they are not in disagreement.

It seems to me that given that kind of a situation, if we begin talking about jurisdiction, we may let the solution fall within the cracks, because we really have had a tremendous achievement in this area. And I don't know that any other place in the country can say this, where almost uniformly, perhaps 99 and 44/100 percent, in dealing with the problems, we have got the States, the Federal Government, the local governments and the industries to agree on a program and a detail of what is to be done. Our question here is to find that we are going to do this in a proper manner. I tell you when you look at the reports that have come up here, we can see a reflection of this so far and I am sure

Wisconsin will follow suit with its report. So I think that this might be the best way to handle this.

In conclusion, you know, I would like to congratulate Mr. Klassen. He is really the Vince Lombardi of water pollution control because not only does he run a hard-hitting program and an effective program in the State, but he is an expert on trades since he can send his effluents to these other States. (Laughter.) I don't know how he does it, but bless him.

MR. POSTON: Are you intimating, Mr. Stein, that he is going to Washington?

MR. STEIN: Well, he is welcome.

MR. KLASSEN: Heaven forbid.

(Laughter.)

MR. STEIN: He is welcome.

MR. KLASSEN: It is complicated enough here.

MR. STEIN: We can't pay him enough.

MR. KLASSEN: We thank you for all these accolades, Mr. Chairman, really. I don't deserve them.

MR. STEIN: Oh, sure you do.

MR. KLASSEN: That is why I raise the

question. Since you talk about Vince Lombardi, every coach doesn't like to be accused of fumbling the ball. And I didn't include these in the Calumet River because I don't feel that they are in this Conference. If they are, we should be so advised and you will get a full report. I am not raising the question of jurisdiction.

MR. STEIN: Let's reserve that question--

MR. KLASSEN: Good.

MR. STEIN: --since I see there is nothing to be gained at this point by that.

MR. KLASSEN: Not a thing.

MR. STEIN: And I can't see that we can move our operation there any further with a report now.

MR. KLASSEN: I agree with you.

MR. STEIN: May we go on, unless there are any other questions?

MR. KLASSEN: Mr. Vaughn, Chicago Water Department, a brief statement summarizing their results so far as water quality at their water works intakes. It is always a high point in all of these Conferences because Chicago Water Department for many years has maintained a long and excellent record.

And, Jim, if you will briefly summarize these, we will appreciate it.

STATEMENT BY JAMES C. VAUGHN
ENGINEER OF WATER PURIFICATION
DEPARTMENT OF WATER AND SEWERS
CHICAGO, ILLINOIS

MR. VAUGHN: Thank you, Mr. Klassen.

Mr. Chairman, Conferees, and ladies and gentlemen.

This report ties together the previous reports, starting with the 1965 report, the one to the Four-State Conference a year ago, and the Two-State Conference in December, bringing it up to January 1969.

If you will show the first slide, we will sort of orient ourselves as to locations and distances.

Briefly, the south water plant control point for open waters in this area is about 30 miles from Waukegan, which is the limit of the pollution source area to the north, and the south plant is about 10 miles from the Indiana Harbor Ship Canal, the principal source of pollution from the south. And the central plant is some 10 miles less than that from Waukegan and more than that from the ship canal.

Now to go on to the second slide. The bacteria at the plant over 1968 shows a maximum of 2,400 and an average of 82.0. And January 1969 the same maximum, a maximum of 180. That is lower than previous figures.

Now if we can have the next slide.

The number of odor periods is somewhat less than in previous years and the number of odor days somewhat less, although 1968 was the worst year that we have had.

If we can have the next slide now I will go quickly into that.

The maximum ammonia nitrogen was 0.260 for 1966, 0.260 for 1967, and it is 0.250 for 1968 and for January 1969.

Now, if we can have the next slide, please.

The maximum activated carbon reached a new high in January of 1969, 557 pounds per million gallons, while the 411 in 1968 was less than the 557 in 1967.

Now, we will go on to the next slide, please.

These show the location of the sampling points. The ones with the heavy circles are the points that we still sample. Prior to the 1965 Conference we sampled all the other points and we make these surveys weekly and observe the general conditions in the area at the time. We try to randomize the days of sampling in order that respective contributing polluters may not interpret us as having a pattern.

Now we will go to the next slide.

The average coliform bacteria for the Dickey Road Bridge over the Calumet River, which is the nearest point to the lake that we can sample, and the 92nd Street Bridge over the Calumet River. You see, the bacteria are not significant at the 92nd Street and they are somewhat less at the Dickey Road Bridge, though the count of 1,800,000 in the samples from the Dickey Road Bridge in 1968 is somewhat more than are desirable for treating water. I don't know whether Mr. Poole recalls or not. Running the Hammond plant in 1938, I had 13 days in which the raw water had a count of 24 million plus during that year, so I am not particularly concerned with these bacterial values.

Let's have the next slide, please.

Now, here is one that I still don't have an answer to. The ammonia nitrogen values for the Dickey Road Bridge sample, the average for 1968 was 5.94 parts per million, more than we have ever had before. The January 1969, 11.20 parts per million. And there was some increase also in ammonia nitrogen values at the 92nd Street samples in 1968 and January 1969, around one part per million was the order of magnitude. I don't know why the increase in ammonia nitrogen. Apparently there are some sewage plant effluents that aren't being as well treated as we would desire.

Let's have the next slide, please.

Now, the phenols at the Dickey Road samples show a slight increase and also at the 92nd Street. The level of the 92nd Street Bridge samples is not significant, and the ones at the Dickey Road sample, the increase is not particularly significant but it is there, something that should be kept out of the water.

J. C. Vaughn

Now I would like to read some of the text.

In previous reports we have talked of the migration of pollution slugs in considerable detail. This problem still exists and represents a variability in the problems of water treatment that is not always predictable. Again, some of the slugs of pollution that have beset the South Water Filtration Plant and some of the North Shore Water filtration plants have migrated to the intake of the Central Water Filtration Plant.

Now if we can see the next slide, we will talk briefly about plankton.

The annual day for 1968 was somewhat more than the previous three years but not significantly high and the maximum day is in the same category of being a little higher. These overall counts do not reflect the incidence of the odor-causing bacteria such as--I mean the micro-organisms such as Dinobryon or the screen-clogging organisms such as Cladophora. Those are continuing nuisances. We had a bad July in 1968 from Dinobryon, in June and July, and we had a long period of Cladophora in which it was required to remove the Cladophora from the fixed screens of the South Water Plant.

J. C. Vaughn

Mr. Klassen in a discussion at one of the recent Conferences mentioned his interest in the increase in chlorides and sulfates. Now, under the direction of the municipal subcommittee in the Great Lakes-Illinois River Basin Project, Dr. Larson, of the State Water Survey, plotted chlorides and sulfates going back to 1860.

If I may have the next slide. This is a slide of historical interest.

They did four samples in 1860, two sulfates and two chlorides. You see the range was in the median line of about five parts per million, and he predicts that if he projects those lines we will have sulfates of thirty parts per million and chlorides of twelve parts per million by the year 2000.

Now, Mr. Reed, Philip A. Reed, who is in the audience and who is my technical assistant, helps prepare all these technical data accumulations, has prepared a chart of his own based on more recent points by Dr. Larson.

The next slide, please.

And he has also drawn some progression

lines in there indicating that by 1975 we should have a value of 23 parts per million, which is the limit for open waters, of sulfates and 7.7 parts per million of chlorides.

At this point I would like to digress from the text to mention that during the month of January 1969 that the raw water at the Central Plant exceeded the limit of 23 parts per million for open waters on every day tested, which was 31 days out of 31, so I think it is high time that we begin to consider chlorides and sulfates as significant pollutants, because there will come a level one of these days in which they become very critical in the treatment of water, for special uses at least.

From the basic report this statement is repeated: "Any condition requiring the use of 20 pounds of activated carbon per million gallons of water or more than 13 pounds of chlorine per million gallons will be recorded as a pollution load on the plant." When the carbon feeds are increased to 40 pounds per million gallons, more coagulation is required to aid in the settling out of the carbon.

J. C. Vaughn

After a study of plant operating data, it was concluded that except--there is a typographical error there--in periods of high turbidity, any coagulation dosage of over 90 lb mil gal may be charged to the carbon requirement, therefore to the pollution load.

Now, on the next slide we have plotted several items, the maximum threshold odors, the maximum carbon dosage, and the number of maximum days of usage which are listed in the text, and while the number of maximum days of usage went down a little, the maximum dosage per million gallons in the month of January went up to 557, which was higher than in 1968. The number of odor days was somewhat less, maximum days of usage in previous years, but we had four of them in January in which we exceeded.

In Table I-1 it is marked "continued," that means continued from previous years, so if you will just strike out the abbreviation at the top of Table I-1.

Now, in another table, for which we do not have a slide, is listed the cost of chemicals. Alum has risen from $39.95 to $43.45 in the last several years. Chlorine has gone from $83.20 to $93.40, and in the next bid, which will be up in a few weeks, we expect it to be even higher. Activated carbon has gone from $156.70 to $178.60 in three years, and so that is by far the biggest increase in cost.

We recognize that algae are part of the cause of the increase in costs. We actually used more activated carbon in 1968 than in any previous year. We also had the highest cost for activated carbon per million gallons, $2.86.

The coagulant cost is the same order of magnitude and the chlorine cost less than previous years but higher than the overall average of 95 cents per million gallon in the eleven year and one month period.

Now we go briefly to the final slide. The same one. I will read the text in order that I may not vary from that.

In Table I-5 we have listed the number of days tested and the number of days in which the established parameters were exceeded for 17 of the 24 parameters adopted by the FWPCA Conference for the southern end of Lake Michigan and the Calumet area in January 1966.

To the values for the years 1965, 1966 and 1967, we have added the values for 1968. During 1968, the coliform bacteria did not exceed the daily average value of 2500/100 mil on any day of the days tested. The fecal streptococci in 1968 exceeded the base standard of 25/100 ml on 7 days of 359 days tested. The threshold odor in 1968 exceeded the single days value of 8 on 14 days of 366 days tested and the daily average value of 4 on 22 of 366 days tested. In January 1969 the value of 8 was exceeded 6 out of 31 days tested and the daily average of 4 was exceeded 8 out of 31 days tested. The ammonia nitrogen exceeded the daily average value of 0.05 ppm on 8 days of 366 days tested, and 7 out of 31 days tested in January 1969. The total phosphates exceeded the single days value of 0.04 ppm on 239 days out of 362 days tested in 1968 and 24 out of 31 days tested in January 1969. It is significant that the values exceeding the basic parameters most often are those contributing to algal nuisances (namely, ammonia nitrogen and total phosphates) and taste and odor problems (namely, threshold odors and phenol-like substances).

J. C. Vaughn

Conclusions:

There has been no improvement in the one parameter that is largely responsible for the increase in the cost of the chemical treatment of water at the South Water Filtration Plant. While the increase in the use of activated carbon during the year 1968 and through January 1969 is attributable in part to increased plankton-caused tastes and odors, by far the largest portion of the increase is due to the presence of hydrocarbon wastes in the water. The increase in the price of the three principal chemicals (carbon, coagulants, chlorine) the use of which is affected by the pollution load and is also a factor in the increased overall chemical cost, but not a significant one. The extremely high values of ammonia nitrogen in the discharge from the Indiana Harbor Ship Canal is an extremely disturbing situation. Until there is an appreciable reduction in the amount of pollutants that cause 1) an increase in plankton nuisances and 2) an increase in tastes and odors due to industrial wastes, there can be no conclusion that there has been a significant improvement in raw water quality in the southern end of Lake Michigan.

J. C. Vaughn

Thank you.

(The following is the document submitted by Mr. Vaughn:)

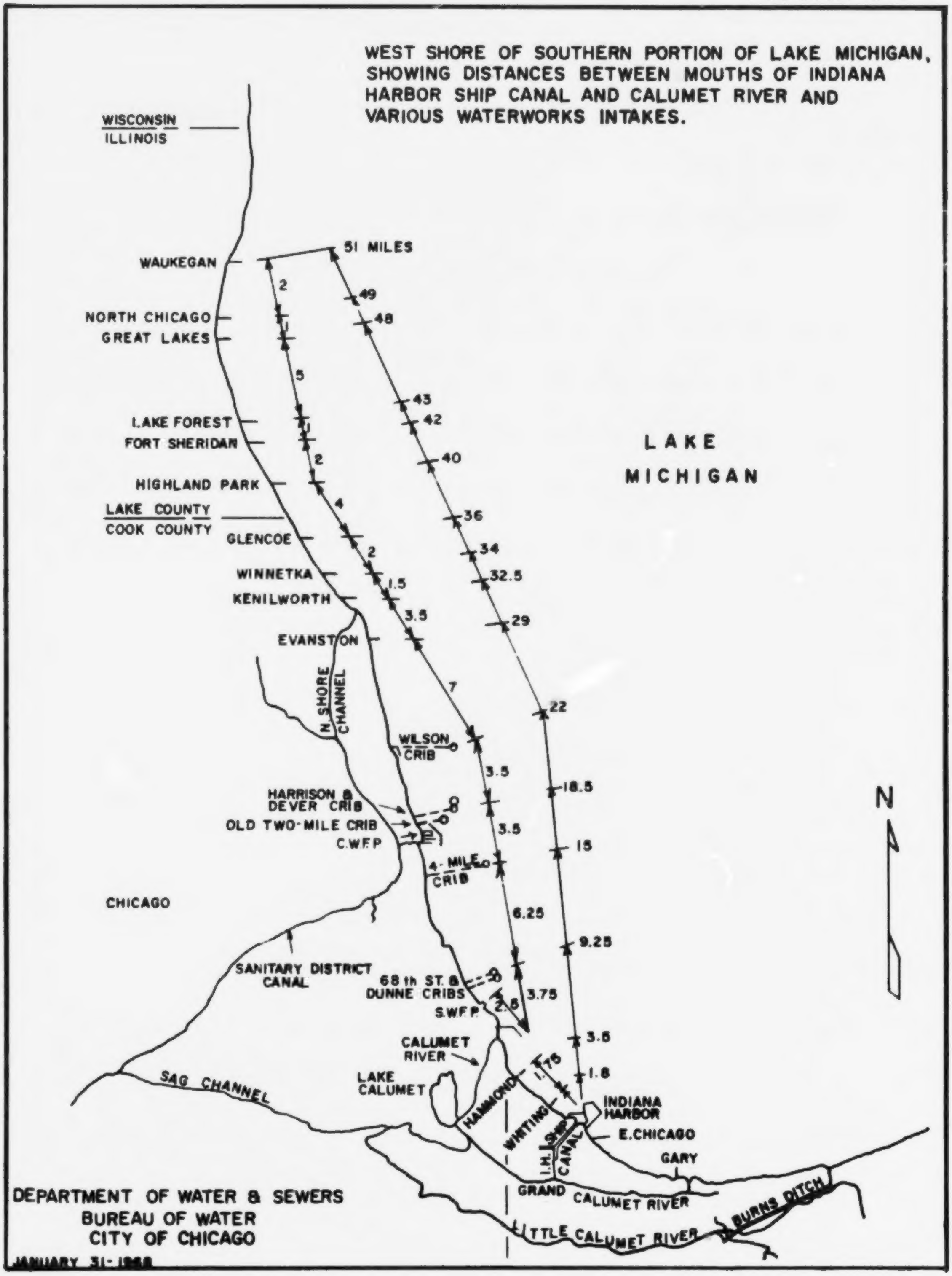
A CURRENT REPORT ON EFFECT OF WATER QUALITY DETERIORATION ON THE OPERATION OF CHICAGO'S SOUTH WATER FILTRATION PLANT

Presented at the Federal Water Pollution Control Administration Conference, February 25, 1969.

Prepared for the Bureau of Water
Department of Water and Sewers
by
James C. Vaughn, Engineer of Water Purification
City of Chicago
Department of Water and Sewers
Richard J. Daley, Mayor
James W. Jardine, Commissioner

R. D. Johnson	R. O. Waller
Deputy Commissioner	Chief Water Engineer

FIGURE C-1



WEST SHORE OF SOUTHERN PORTION OF LAKE MICHIGAN, SHOWING DISTANCES BETWEEN MOUTHS OF INDIANA HARBOR SHIP CANAL AND CALUMET RIVER AND VARIOUS WATERWORKS INTAKES.

WISCONSIN
ILLINOIS
WAUKEGAN
51 MILES
2
49
48
NORTH CHICAGO
GREAT LAKES
1
5
43
42
LAKE FOREST
FORT SHERIDAN
1
2
40
HIGHLAND PARK
LAKE COUNTY
COOK COUNTY
4
36
GLENCOE
34
2
WINNETKA
32.5
1.5
KENILWORTH
3.5
29
EVANSTON
N. SHORE CHANNEL
7
22
WILSON CRIB
3.5
18.5
HARRISON & DEVER CRIB
OLD TWO-MILE CRIB
3.5
C.W.F.P.
15
4-MILE CRIB
CHICAGO
6.25
9.25
SANITARY DISTRICT CANAL
68th ST. & DUNNE CRIBS
2.5
3.75
S.W.F.P.
3.5
CALUMET RIVER
1.75
1.8
LAKE CALUMET
HAMMOND
INDIANA HARBOR
WHITING
I.H. SHIP CANAL
E. CHICAGO
SAG CHANNEL
GARY
GRAND CALUMET RIVER
LITTLE CALUMET RIVER
BURNS DITCH
LAKE MICHIGAN
N

DEPARTMENT OF WATER & SEWERS
BUREAU OF WATER
CITY OF CHICAGO

JANUARY 31-1968

J. C. Vaughn

A CURRENT STATEMENT ON THE EFFECT OF WATER QUALITY DETERIORATION ON THE OPERATION OF CHICAGO'S SOUTH WATER FILTRATION PLANT, PRESENTED FEBRUARY 25, 1969

The material submitted herewith is an updating of the material that was presented in a report to the Four State Pollution Conference held by the Federal Water Pollution Control Administration (FWPCA) in Chicago beginning January 31st, 1968. The material was partially updated in the supplemental report made to the Two States Pollution Conference held in Chicago under the auspices of the FWPCA on December 11-12, 1968. This current report brings the data up through all of 1968 and January 1969. The tables and charts have been brought up through this period and a discussion of the current data will be given.

Bacterial Pollution

The average coliform bacteria per 100 ml at the South Water Filtration Plant (SWFP) intake (raw water header) for the year 1968 and for the month of January 1969 have been tabulated in table D-1 plotted on Chart D-1 which are shown together in the figure. It is noted that the average coliform 82.0 for 1968 is higher than the average for 1965 and 1966, but not so high as the value of 260 per 100 ml for 1967. The average value for January 1969 of 180 per ml falls into the same category. The maximum of 2400 per 100 ml both for 1968 and January 1969 exceed the maximum values for 1964, 1965 and 1966; but is less than the 13,000 per 100 ml maximum value for 1967.

Abnormal Pollution at SWFP Intakes

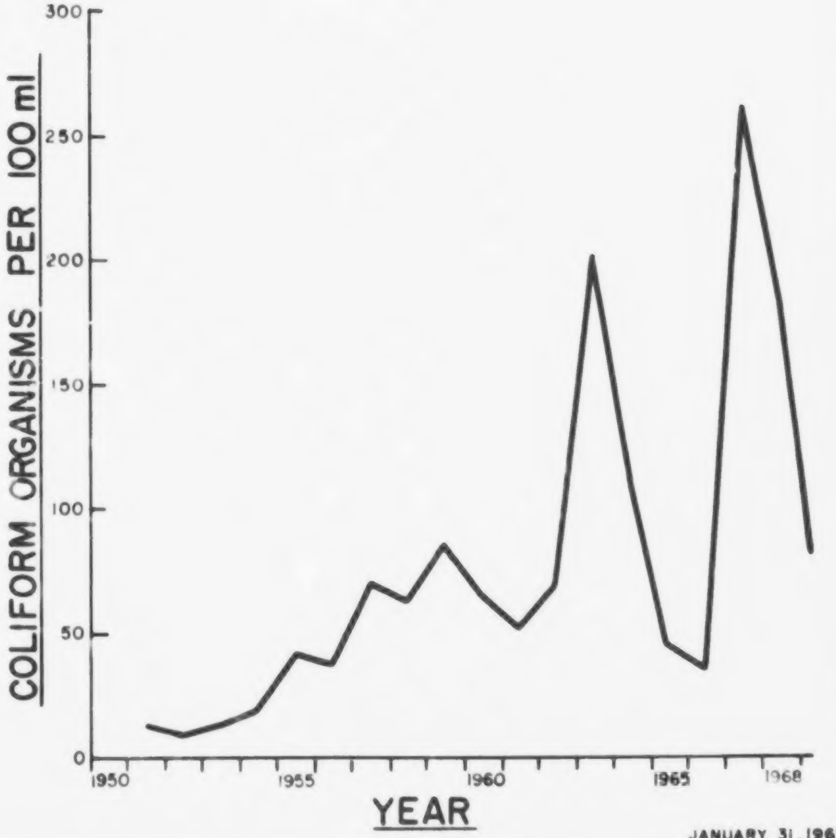
The data on abnormal hydrocarbon (oil refinery wastes) odor periods for the past 18 years was brought up to date through January 1969 in Table D-2 plotted on Chart D-2. The number of odor periods (22) during 1968 exceeds the values for 1965 and 1967, but it was somewhat less than the equivalent values (26) for 1966. The number of odor days (57) exceeds the value of 46 for 1965, but is less than the equivalent values in 1966 and 1967. The maximum threshold odor reached during this period was 25 CH which exceeds the value of 17 for 1965 and matches that of 20 for 1967. In January 1969 we had a total of 5 threshold odor periods and 14 threshold odor days. There were 14 days in the 4-20 threshold odor range and none above that

FIGURE D-1

AVERAGE COLIFORM PER 100 ml
SOUTH WATER FILTRATION PLANT INTAKE
1950 - 1968

YEAR	COLIFORM PER 100 ml	
	ANNUAL AVERAGE	MAXIMUM DAY
1950		
1951	14.0	375
1952	9.7	495
1953	13.9	534
1954	20.0	959
1955	42.3	1300
1956	38.7	1400
1957	70.8	9600
1958	63.1	6400
1959	85.6	3200
1960	65.2	2900
1961	52.4	3000
1962	69.5	1700
1963	200.8	5800
1964	110.2	1900
1965	46.3	1100
1966	35.8	1200
1967	260.0	13000
1968	82.0	2400
*1969	180.0	2400

* JANUARY ONLY



DEPARTMENT OF WATER & SEWERS
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JANUARY 31, 1969

TABLE D-2

SUMMARY OF "OIL REFINERY WASTE" TYPE ABNORMAL ODOR PERIODS IN RAW LAKE WATER SUPPLY TO SOUTH WATER FILTRATION PLANT

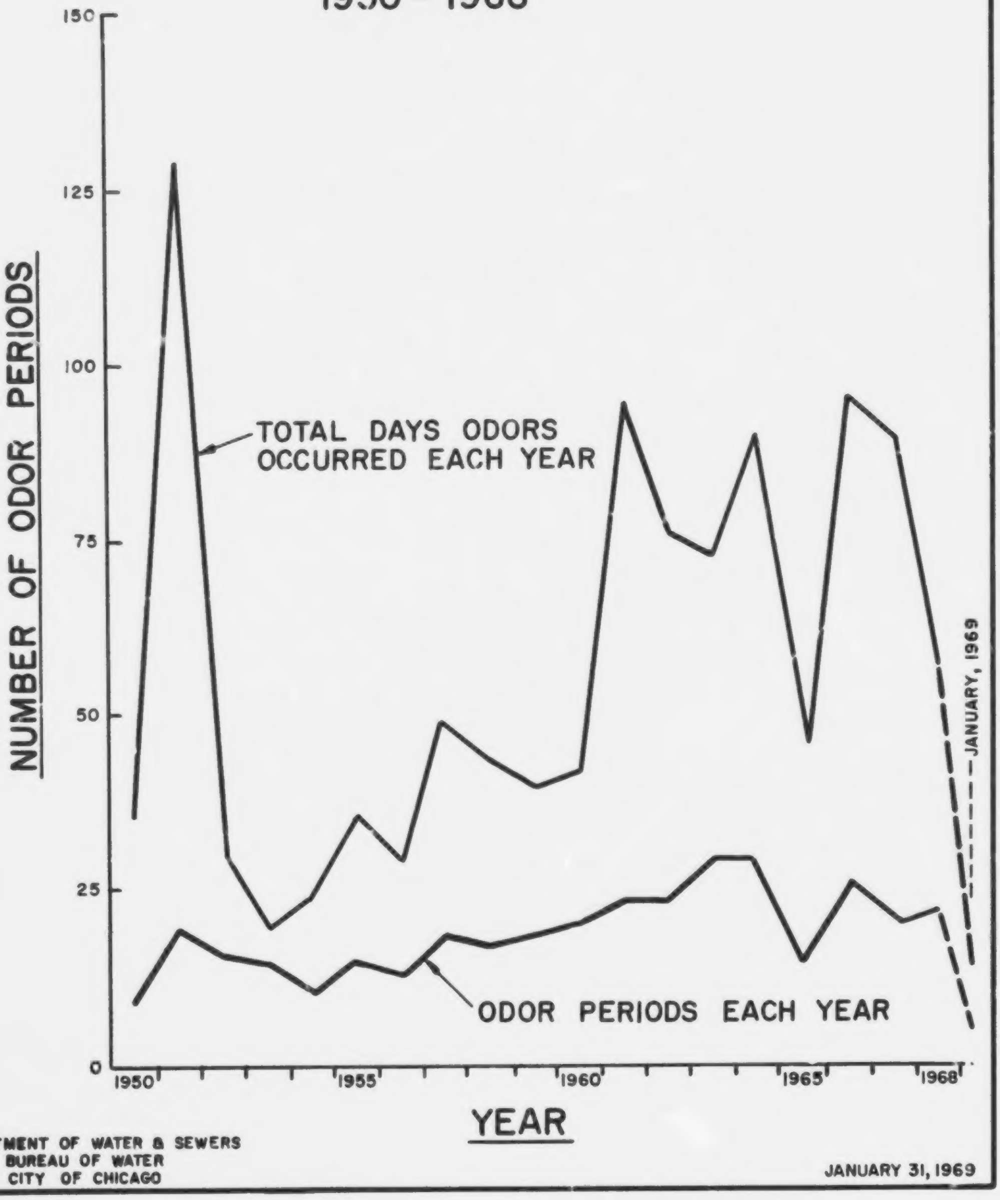
1950 - JANUARY 31, 1969

YEAR	NUMBER OF ODOR PERIODS	TOTAL ODOR DAYS	MAXIMUM THRESHOLD ODORS DURING PERIODS 4-20	21-50	51-100	MAXIMUM ACTIVATED CARBON DOSAGE APPLIED LB/MIL GAL
1950	10	36	6	3	1	1,158
1951	20	127	16	4	-	446
1952	17	30	16	1	-	590
1953	16	18	16	-	-	266
1954	12	23	11	1	-	356
1955	15	36	15	-	-	279
1956	13	28	12	1	-	415
1957	18	49	18	-	-	325
1958	17	43	16	1	-	503
1959	19	40	17	2	-	712
1960	21	42	20	1	-	324
1961	23	94	23	-	-	386
1962	23	76	23	-	-	270
1963	28	72	27	1	-	680
1964	28	89	27	-	1	745
1965	15	46	14	1	-	320
1966	26	95	25	1	-	385
1967	21	89	20	1	-	557
1968	22	57	17	1	-	411
JAN.1969	5	14	14	1	-	557

FIGURE D-2

ABNORMAL "OIL REFINERY" TYPE ODOR PERIODS

SOUTH WATER FILTRATION PLANT INTAKE
1950 - 1968



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BUREAU OF WATER
CITY OF CHICAGO

JANUARY 31, 1969

range. The maximum activated carbon dosage applied (411 lb/mil gal) applied in 1968 exceeds the similar maximum values for 1965 and 1966 though somewhat less than the 557/lb mil gal reached in 1967. The maximum carbon dosage also reached 557/lb mil gal in January 1969 which equals the equivalent value for 1967 and exceeds the values for 1965, 1966 and 1968.

It must be remembered that a water treatment plant must be prepared to treat the maximum demands that will be placed upon it as to quantity and quality, otherwise an unsatisfactory water supply will frequently be delivered to the consumer.

In Table D-3, the data for 1968 for maximum ammonia nitrogen in (ppm), maximum activated carbon dosage (lb/mil gal), and maximum chlorine dosage (lb/mil gal) have been added. The maximum ammonia nitrogen value (ppm 0.250) exceeds that for 1965 and is equivalent to that for 1966 although it is less than the value for 1967. The maximum carbon dosage (411 lb/mil gal) exceeds the equivalent values for 1965 and 1966 and is somewhat less than the maximum value for 1967. The maximum chlorine dosage (51.1 lb/mil gal) is of the same order of magnitude as the equivalent value for 1967. In January 1969 the maximum ammonia nitrogen value of 0.250 ppm which equalled the maximum value for 1968, exceeded the equivalent value for 1965 and was of the same order of magnitude as the value of 0.260 for 1966 and is less than the value of 0.260 for 1967. The maximum chlorine value for 1969 was 49.6 lb/mil gal which is less than the equivalent value (51.1 lb/mil gal) for 1968.

TABLE D-3

SUMMARY OF MAXIMUM AMMONIA NITROGEN IN INTAKE WATER SUPPLY, AND ACTIVATED CARBON AND CHLORINE APPLIED DURING ABNORMAL ODOR POLLUTION PERIODS

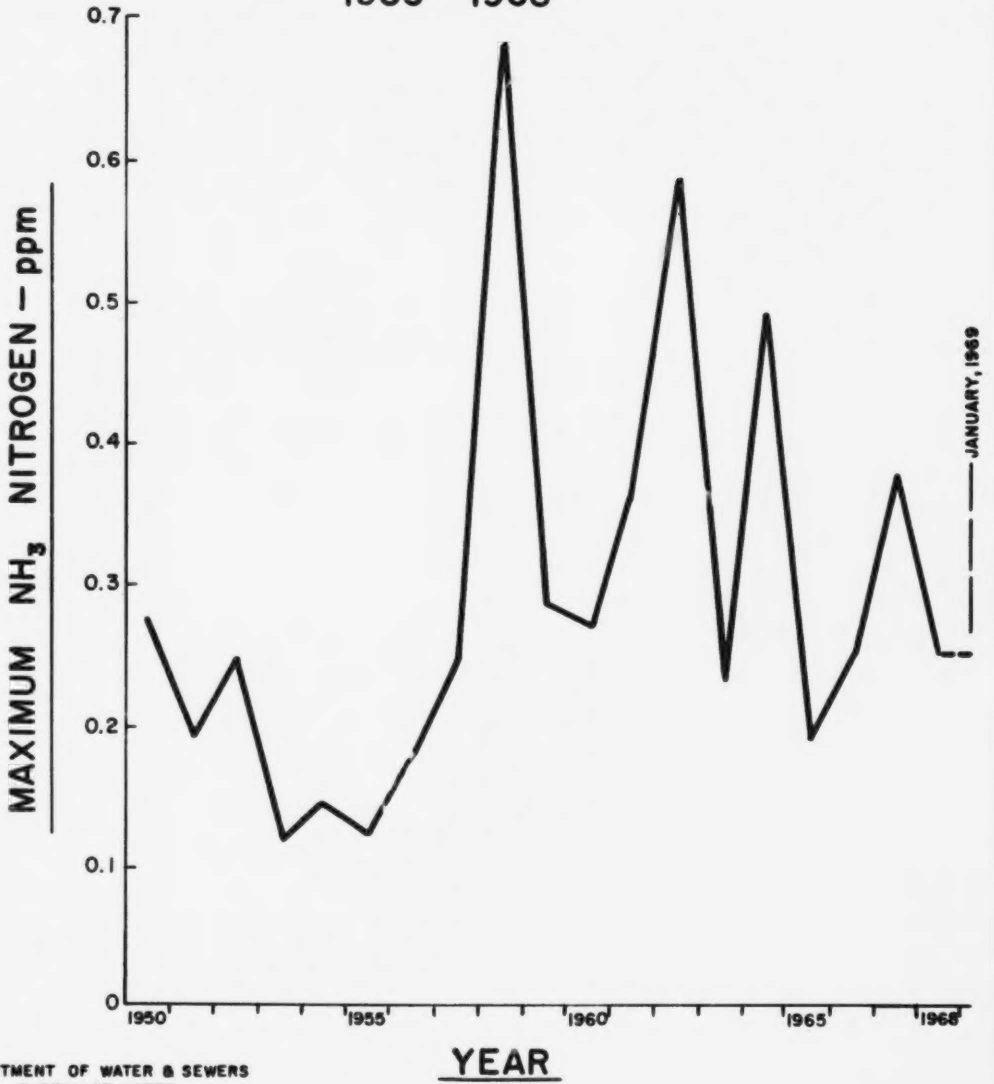
SOUTH WATER FILTRATION PLANT, 1950 - JANUARY 31, 1969

YEAR	MAXIMUM AMMONIA NITROGEN (PPM)	MAXIMUM ACTIVATED CARBON DOSAGE (LB/MIL GAL)	MAXIMUM CHLORINE DOSAGE (LB/MIL GAL)
1950	0.276	1,158	84.0
1951	0.196	446	45.5
1952	0.248	590	45.1
1953	0.120	266	35.4
1954	0.148	356	20.8
1955	0.125	279	24.3
1956	0.180	415	24.4
1957	0.248	325	26.8
1958	0.680	503	19.4
1959	0.290	712	24.5
1960	0.272	324	16.0
1961	0.358	388	20.3
1962	0.590	370	27.2
1963	0.230	680	42.8
1964	0.496	745	56.1
1965	0.198	320	53.1
1966	0.260	385	53.9
1967	0.260	557	70.0
1968	0.250	411	51.1
JAN. 1969	0.250	557	46.9

FIGURE D-3

MAXIMUM AMMONIA NITROGEN DURING ABNORMAL "OIL REFINERY" TYPE ODOR PERIODS

SOUTH WATER FILTRATION PLANT INTAKE
1950 – 1968



DEPARTMENT OF WATER & SEWERS
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JANUARY 31, 1969

TABLE D-4

SUMMARY OF ACTIVATED CARBON APPLIED FOR REMOVAL OF ODORS IN LAKE WATER SOUTH WATER FILTRATION PLANT

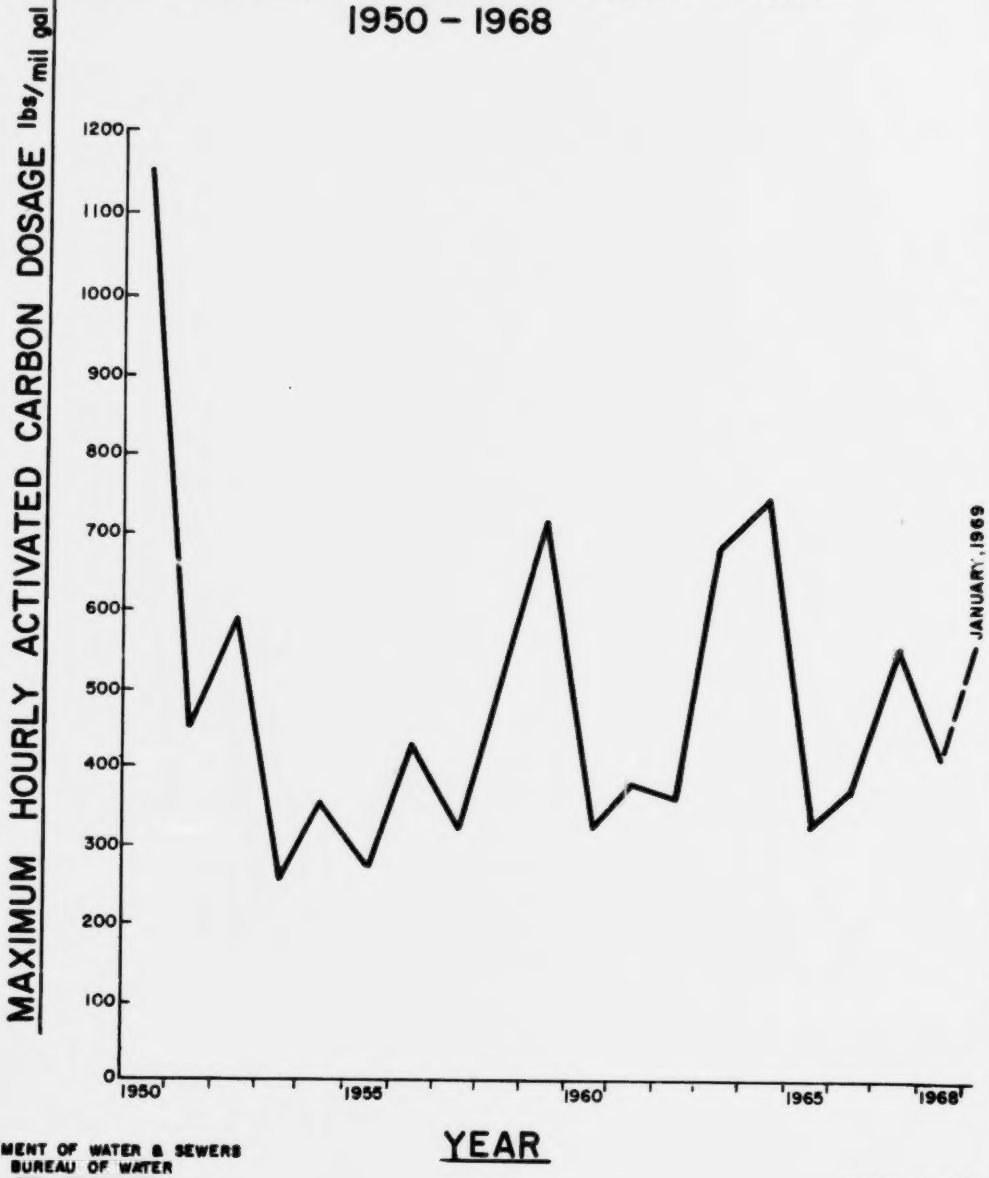
1950 - JANUARY 31, 1969

YEAR	TOTAL ACTIVATED CARBON APPLIED (LB)	AVERAGE CARBON DOSAGE (LB/MIL GAL)	MAXIMUM HOURLY CARBON DOSAGE DURING ODOR PERIOD (LB/MIL GAL)
1950	2,874,905	26	1,158
1951	3,545,552	31	446
1952	3,203,426	26	590
1953	1,775,063	14	266
1954	2,011,359	16	356
1955	2,057,781	17	279
1956	1,981,108	16	415
1957	3,032,729	24	325
1958	2,762,540	22	503
1959	3,035,509	23	712
1960	2,727,005	21	324
1961	2,632,923	21	388
1962	2,865,541	22	370
1963	3,194,443	23	680
1964	3,773,655	27	745
1965	3,094,606	23	320
1966	4,678,661	33	385
1967	4,455,273	32	557
1968	4,879,309	33	411
JAN. 1969	538,793	48	557

FIGURE D-4

MAXIMUM ACTIVATED CARBON DOSAGE DURING ABNORMAL "OIL REFINERY" TYPE ODOR PERIODS

SOUTH WATER FILTRATION PLANT INTAKE
1950 - 1968



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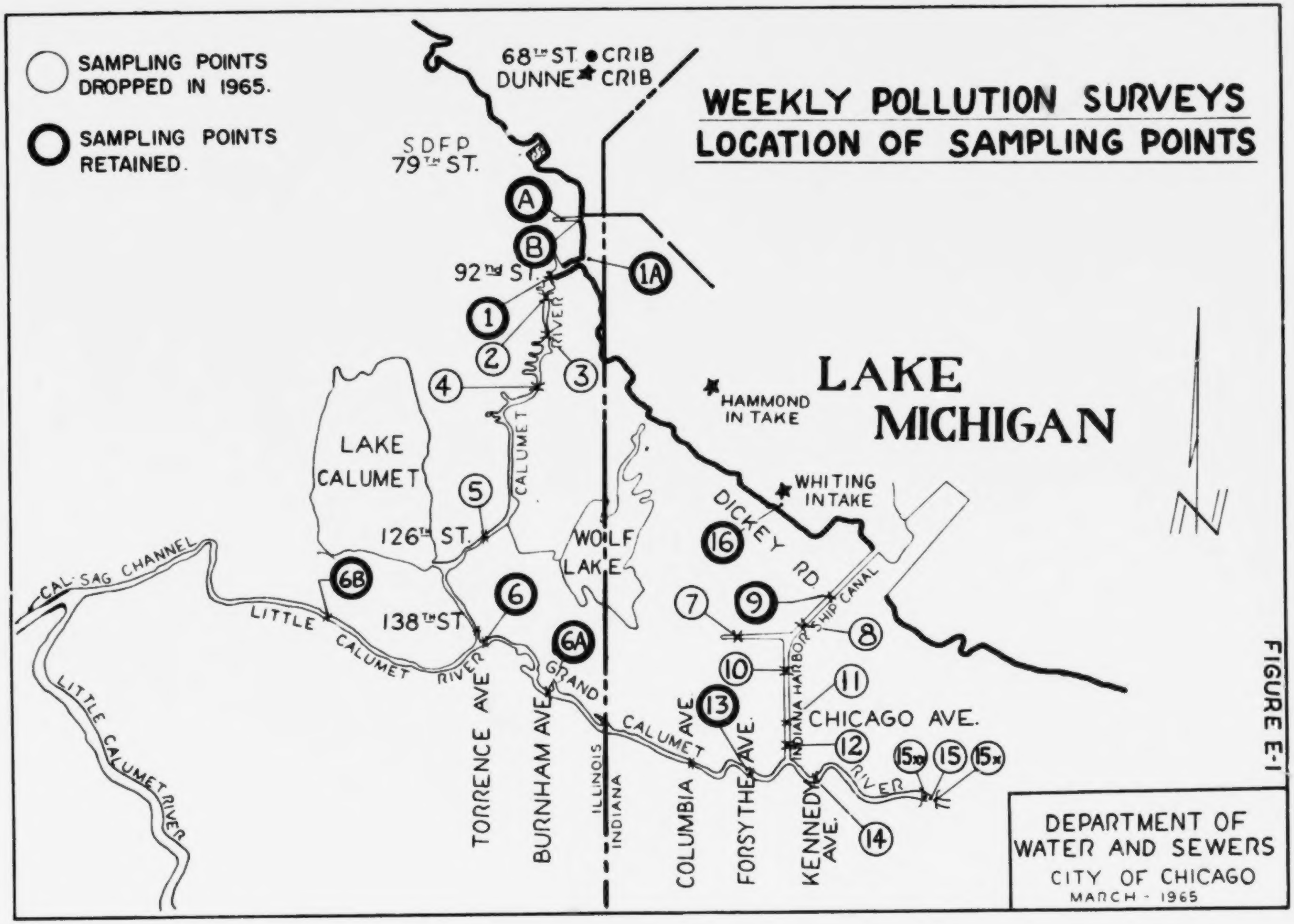


FIGURE E-1

WEEKLY POLLUTION SURVEYS
LOCATION OF SAMPLING POINTS

DEPARTMENT OF
WATER AND SEWERS
CITY OF CHICAGO
MARCH - 1965

○ SAMPLING POINTS DROPPED IN 1965.
● SAMPLING POINTS RETAINED.
68TH ST. ● CRIB
DUNNE ★ CRIB
SDFP 79TH ST.
92ND ST.
A
B
1A
1
2
3
4
5
6
6A
6B
7
8
9
10
11
12
13
14
15xx
15
15x
16
LAKE MICHIGAN
HAMMOND INTAKE
WHITING INTAKE
DICKEY RD.
LAKE CALUMET
WOLF LAKE
126TH ST.
138TH ST
CALUMET RIVER
LITTLE CALUMET RIVER
CAL-SAG CHANNEL
GRAND CALUMET RIVER
INDIANA HARBOR SHIP CANAL
CHICAGO AVE.
TORRENCE AVE
BURNHAM AVE
ILLINOIS
INDIANA
COLUMBIA AVE
FORSYTHE AVE.
KENNEDY AVE.
N

J. C. Vaughn

In Figure E-4, the annual average coliform organisms per 100 ml are plotted for the IHSC at the Dickey Road Bridge and the Calumet River at the 92nd Street Bridge. The values for 1968 and January 1969 have been added to the values for the previous years. There is a considerable drop-off in the value of coliform organisms in the samples taken from the IHSC at the Dickey Road Bridge. However, the average value for the 1968 of 1,800,000 coliform per 100 ml is a figure much too high for a desirable raw water. The value at the 92nd Street Bridge on the Calumet River shows a slight drop-off but has not been significant in previous years. The January 1969 value of 78,000 per 100 ml for the Dickey Road samples and 780 per 100 ml at the 92nd Street Bridge fit the general pattern.

In Figure E-5, the average ammonia nitrogen values in ppm are plotted for the two points under discussion. Surprisingly, the average value of 5.94 ppm ammonia nitrogen for the samples taken at the Dickey Road Bridge for the 1968 period, is far in excess of any previously recorded value. The January 1969 value of 11.20 ppm is even more excessive. We have no explanation for these increases in ammonia nitrogen values. It might be deduced that the efficacy of treatment of sewage plant effluents being contributed to the Ship Canal is not as high as could be desired or even expected. Similarly, there has been an increase in the ammonia nitrogen value of the samples taken at the 92nd Street Bridge of the Calumet River. The 1968 average value of 0.99 ppm and the January 1969 value is 1.08 ppm. The same conclusion as to cause might be drawn.

In Figure E-6, the annual average phenol values in ppm for the same two tributary points are shown. The averages for the 1968 and January 1969 period have been added to the plotted results of the previous years. At both points there has been a slight increase in the phenol values.

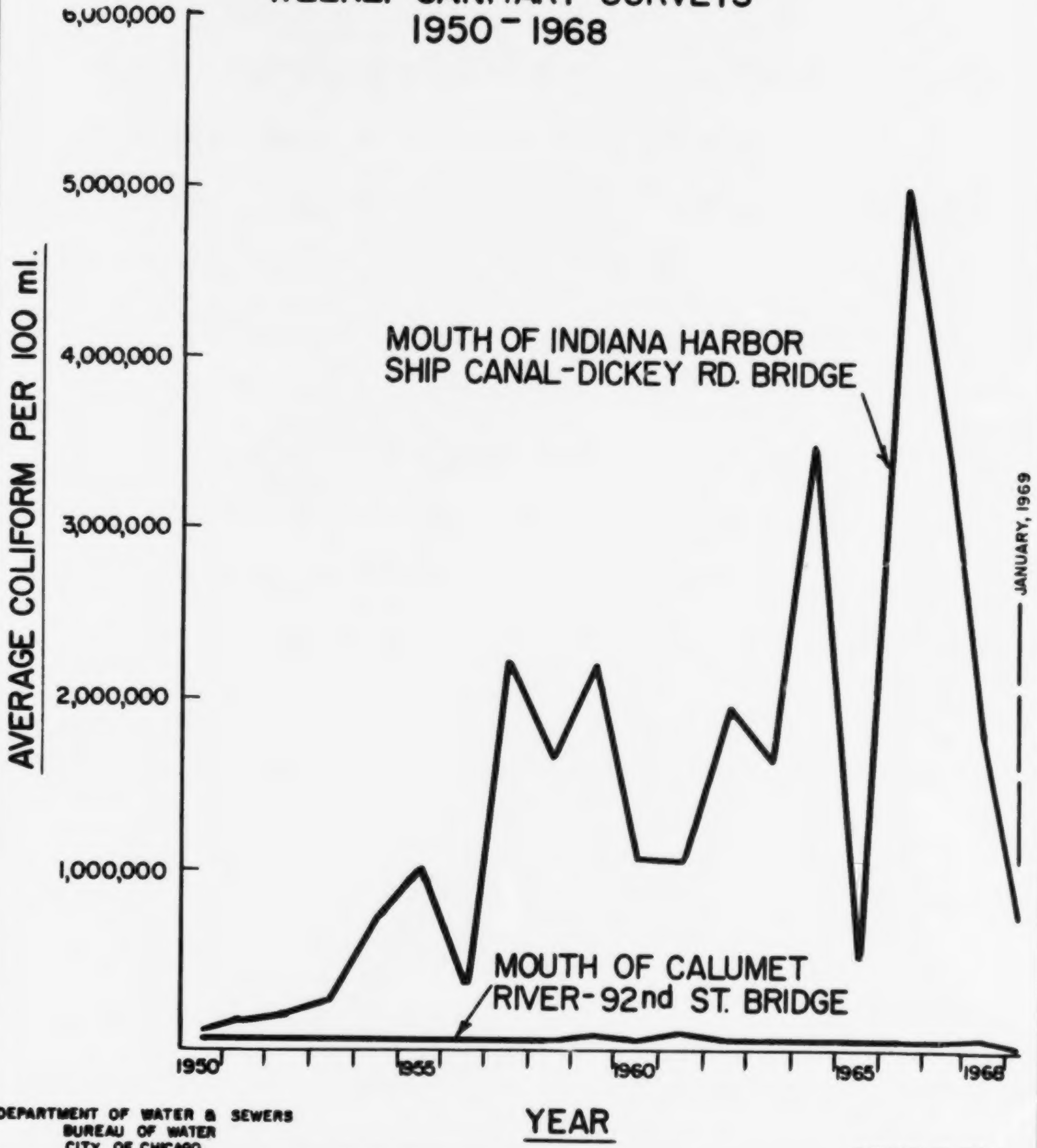
Migration of Pollution Slugs

In previous reports this migration of pollution slugs has been described in considerable detail. This problem still exists and represents a variability in the problems of water treatment that is not always predictable. Again, some of the slugs of pollution that have beset the SWFP and some of the

FIGURE E-4

ANNUAL AVERAGE COLIFORM ORGANISMS PER 100 ml.

WEEKLY SANITARY SURVEYS
1950 - 1968



DEPARTMENT OF WATER & SEWERS
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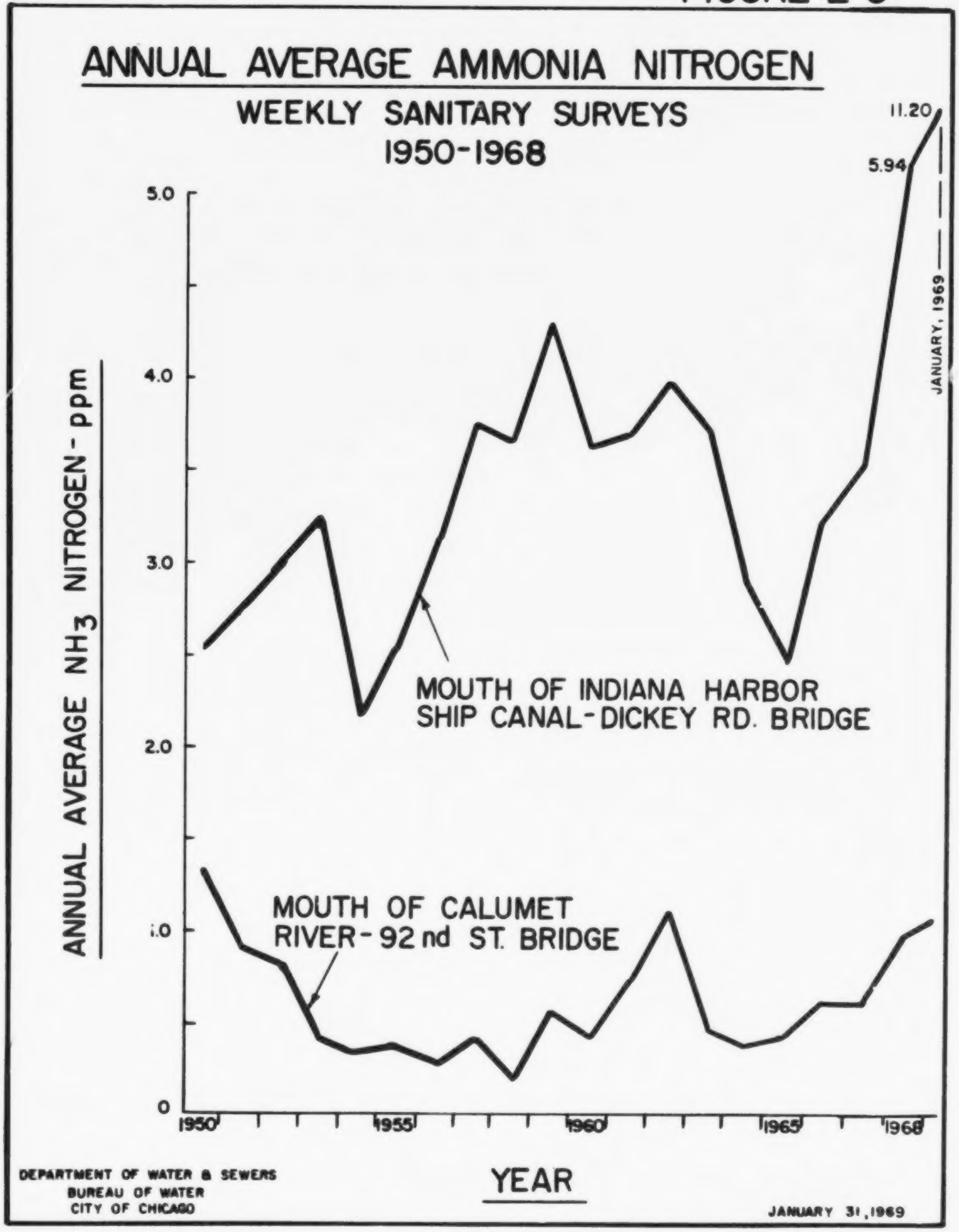
CITY OF CHICAGO

JANUARY 31, 1969

FIGURE E-5



ANNUAL AVERAGE AMMONIA NITROGEN

WEEKLY SANITARY SURVEYS
1950-1968

DEPARTMENT OF WATER & SEWERS
BUREAU OF WATER
CITY OF CHICAGO

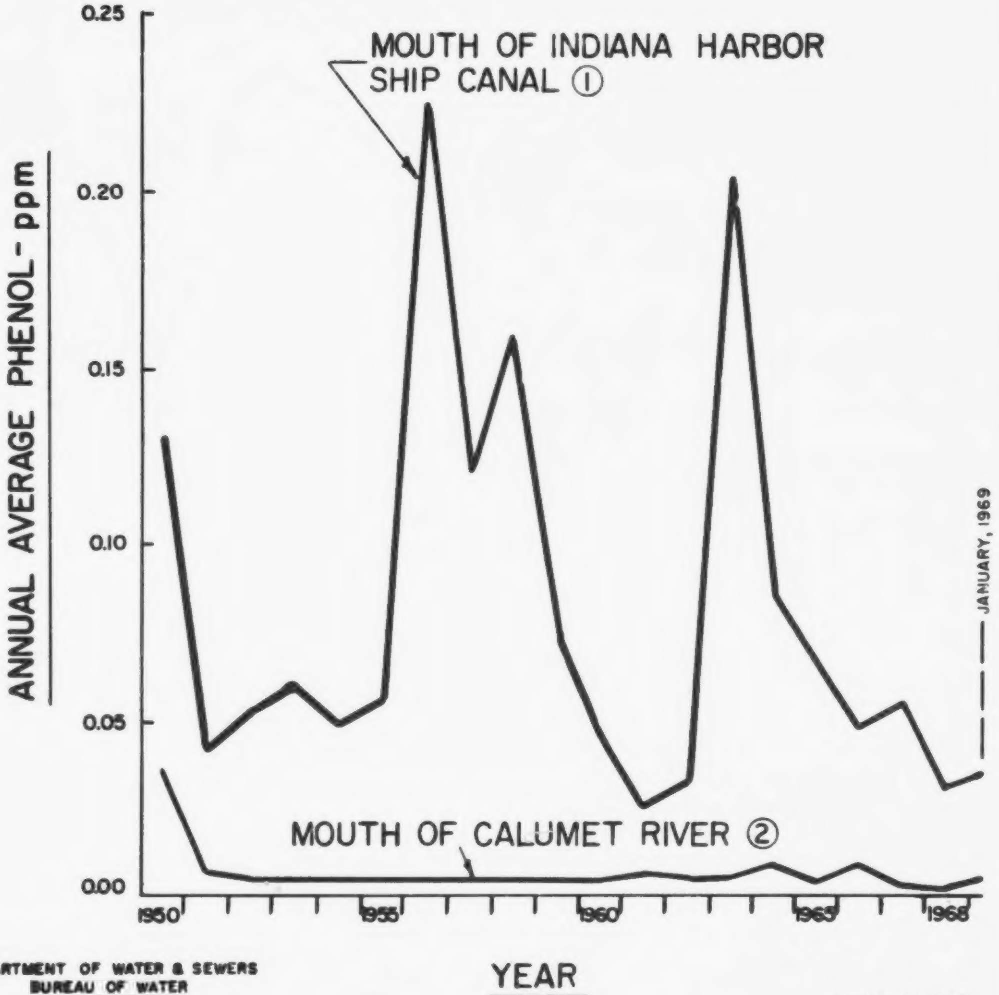
JANUARY 31, 1969

FIGURE E-6

ANNUAL AVERAGE PHENOL
WEEKLY SANITARY SURVEYS
1950-1968

① INDIANA HARBOR SHIP CANAL SAMPLING AT CANAL ST. BRIDGE (1950-1959) AND DICKEY RD. BRIDGE (1960-1967)

② CALUMET RIVER SAMPLING AT 92nd ST. BRIDGE (1950-1967)



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North Shore Water filtration plants have migrated to the intake of the Central Water Filtration Plant (CWFP).

Plankton Problems

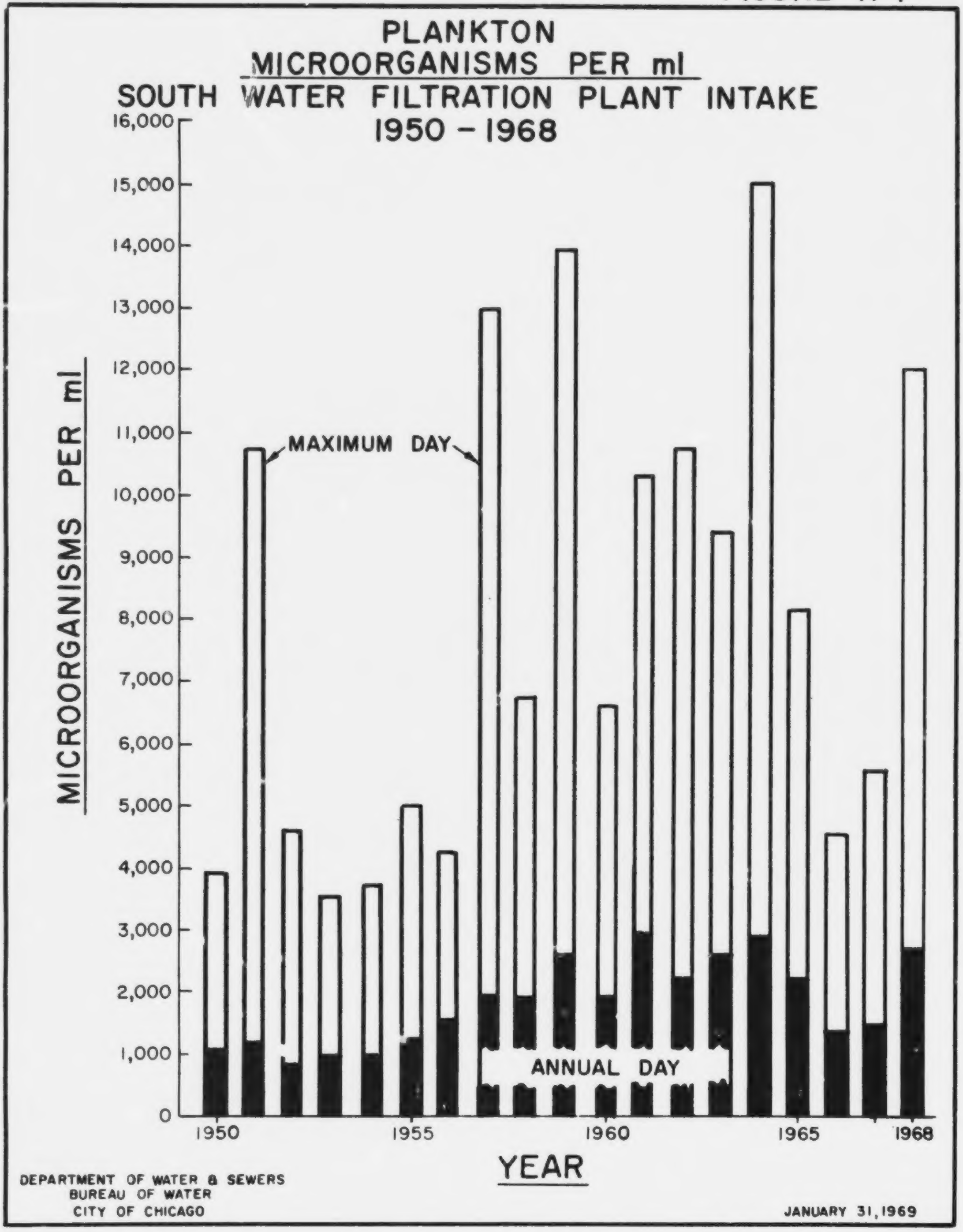
The nature of the general plankton problems besetting the SWFP is described in considerable detail in the basic report. This description will not be repeated. The number of plankton micro-organisms per ml as the annual average and the maximum days are plotted on Chart H-1. It is noted that the maximum day for 1968 period is considerably in excess of any value since 1964. Similarly, the annual average for the same period exceeds any previous value since 1964. The January 1969 average value is 2100 per ml and the maximum value is 3800 per ml. It is pointed out that these values do not indicate the breakdown count of the individual organisms. For example, during the period of June 6-18, the water had an extremely fishy taste attributable to the high incidence of Dinobryon. Neither do the values show the incidence of Cladophora. This organism has been a continuing nuisance. It is torm loose from the beds where it grows and gets into the intake basin and collects on the fixed screens.

The hand labor required for the removal of Cladophora from the screens is excessive and is required intermittently over a period of as long as six months. Perhaps the increase in plankton nuisances may be attributed in part to the increase in the quantity of ammonia nitrogen contributed to the southern end of the lake by the IHSC and the Calumet River as indicated above.

Prevailing Trends of Chlorides and Sulfates in Lake Michigan Water

Several years ago as part of the work of the Municipal Sub-Committee of the Technical Advisory Committee to the Great Lakes-Illinois River Basin Project, Dr. T. E. Larson, head of the Chemical Division of the State Water Survey, plotted the results of analyses of chlorides and sulfates from samples of Lake Michigan water taken at Dunne Crib. This crib is one of the two intakes of the South Water Filtration Plant. These analyses were begun in 1860. There was a period of greater frequency in the 1900-1910 period. About 1926 the frequency of samples was greatly increased. Dr. Larson has drawn trend lines through the points

FIGURE H-1



PLANKTON
MICROORGANISMS PER ml
SOUTH WATER FILTRATION PLANT INTAKE
1950 - 1968

DEPARTMENT OF WATER & SEWERS
BUREAU OF WATER
CITY OF CHICAGO

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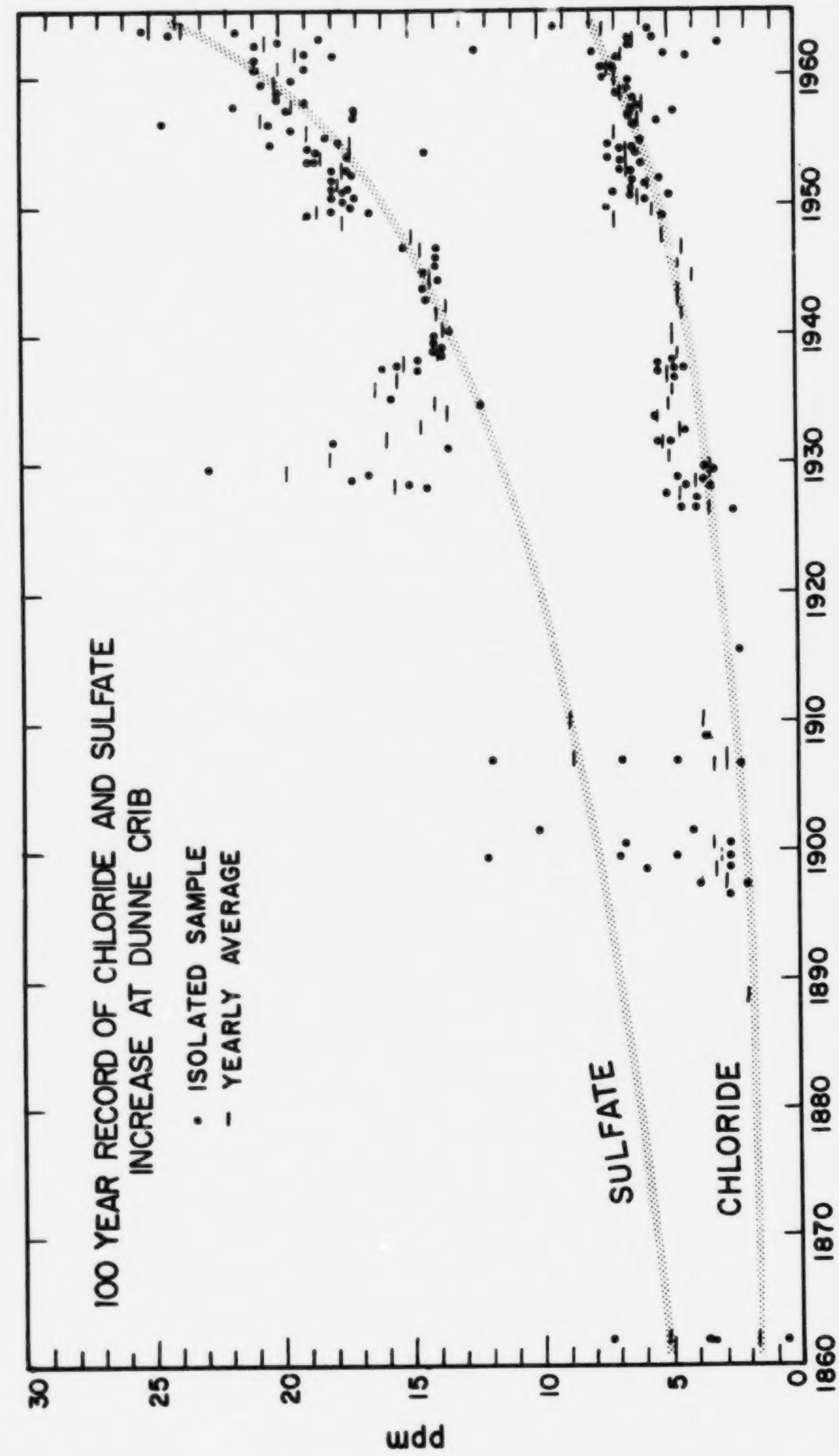
representing these values. I have estimated that these lines, if projected, show values of sulfates at 30 ppm, by the year 2000, and of chlorides at 12 ppm also by the year 2000. The plotting of this data may be seen in Chart S-1.

Philip A. Reed, my technical assistant, (who is also responsible for all of the data submitted in this report) has superimposed some of the data from our own files for chloride and sulfate values onto those of Dr. Larson. This gives a good record from 1926 through 1968. Mr. Reed has drawn some regression lines through the points which if projected to the year 1975 will predict values of 23 ppm for sulfates and 7.7 ppm for chlorides. The plotting of these data may be seen on Chart S-2.

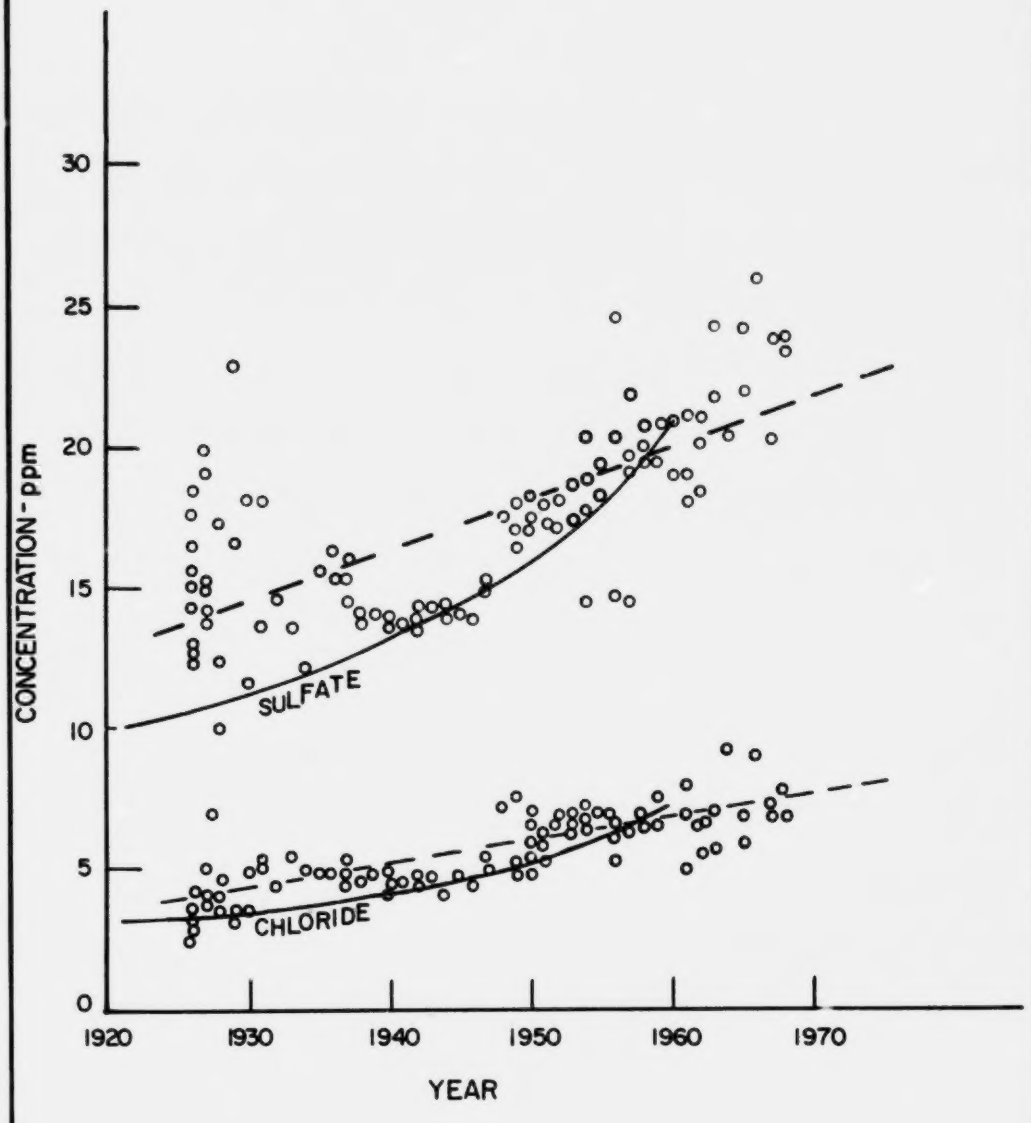
Cost of Treating Polluted Water

From the basic report this statement is repeated: "Any condition requiring the use of 20 lb of activated carbon per million gallons of water or more than 13 lb of chlorine per million gallons, will be recorded as a pollution load on the plant." When the carbon feeds are increased to 40 lb/mil gal, more coagulation is required to aid in the settling out of the carbon.

After a study of plant operating data, it was concluded that, except in periods of high turbidity, any coagulation dosage of over 90 lb mil gal may be charged to the carbon requirement, therefore, to the pollution load. In the basic report, we used the statement "Some maximum days of usage" meaning those days at the SWFP in which the total lb of activated carbon feed amounted to 30,000 lb or more. The number of days in which this occurred for each of the 11 years, 1958 through 1968, and through January 1969 are listed in Table I-1. The total lb of carbon feed each day, the average lb/mil gal, and the maximum lb/mil gal are listed under the activated carbon heading. The maximum threshold odor hours for each of these days is listed under that heading and the maximum ammonia nitrogen hours are likewise listed under its heading. The number of maximum usage days in the 1968 period is 39 which is somewhat higher than the equivalent value for previous years. The increase is confirmed by the total carbon usage for 1968 which is in excess of the


100 YEAR RECORD OF CHLORIDE AND SULFATE
INCREASE AT DUNNE CRIB
• ISOLATED SAMPLE
– YEARLY AVERAGE
SULFATE
CHLORIDE
ppm
0
5
10
15
20
25
30
1860
1870
1880
1890
1900
1910
1920
1930
1940
1950
1960

45 YEAR RECORD OF CHLORIDE AND SULFATE
INCREASE AT DUNNE CRIB



usage for the year of 1967. This supports the conclusion that the cost of water treatment at the SWFP is increasing due in a large degree to pollution.

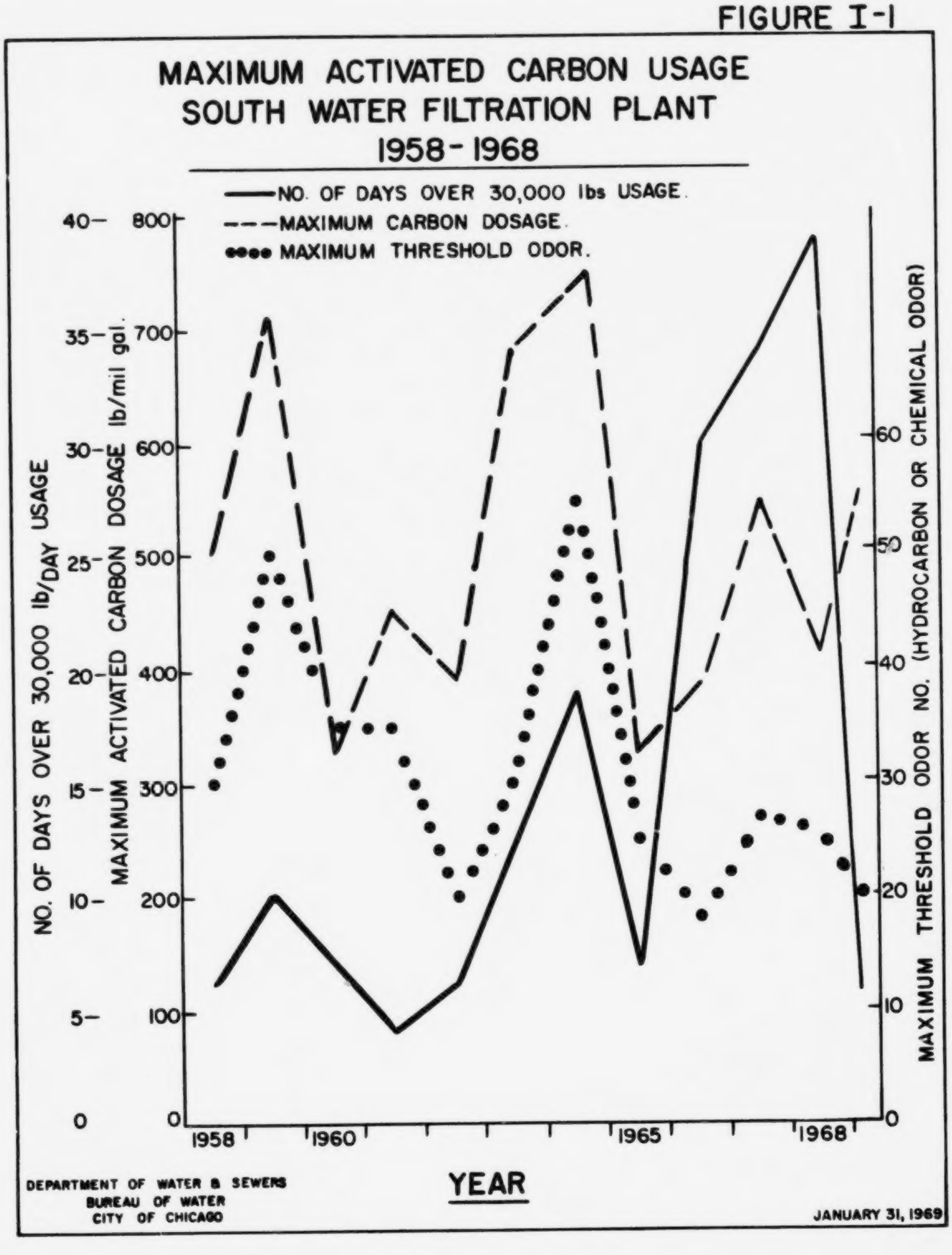
In Table I-2, we have brought the total consumption in lb/mil gal of activated carbon, coagulants and chlorine up to date through 1968 and January 1969. As pointed out above the total carbon consumption for 1968 exceeded that for the year of 1967. The average lb/mil gal was higher than in 1967 and equalled 1966. The average lb/mil gal of coagulants used (109) for the same period is somewhat lower than the overall 11-year and one month average (111) but is still considerably higher than the basic value of 90 lb mil gal mentioned above. The average chlorine dosage (21.3 lb/mil gal) is less than the values for 1966 and 1967 but somewhat higher than the overall average for the 11-year period and one month (20.3). It is considerably in excess of the 13 lb/mil gal, the basic figure mentioned above. In Table I-3, we have brought the cost of the three classes of chemicals for each of the years up through 1968 and January 1969. It is noted that the cost of activated carbon ($2.86/mil gal) is higher than

TABLE I-1 (Cont.)

SOME MAXIMUM DAYS OF USAGE
1968 and JANUARY 1969

Yr., Mo., and Day	*Activated Carbon* Total #	Avg. #/MG	Max. #/MG	*Threshold Odors Maximum Hour*	*Ammonia Nitrogen Max. Hr. (ppm)*
1968					
Jan. 18	45,876	121	240	14 Ch	0.068
Jan. 19	50,698	133	411	14 Ch	0.062
Jan. 20	35,652	97	140	6 Ch	0.042
Jan. 21	35,051	100	158	6 Ch	0.024
Jan. 26	34,088	91	204	5 Ch	0.034
Jan. 27	40,080	113	145	6 Ch	0.054
Jan. 28	42,833	123	129	7 Ch	0.060
Feb. 1	59,404	160	203	10 Ch	0.160
Feb. 2	40,367	107	134	5 Ch	0.072
Mar. 16	36,971	102	146	6 Ch	0.04
Mar. 17	32,133	95	239	6 Ch	0.06
Mar. 18	31,139	80	134	6 Ch	0.08
Mar. 19	92,836	246	353	25 CH	0.25
Mar. 20	61,690	159	338	7 Ch	0.13
Mar. 21	42,755	112	222	7 Ch	0.12
Mar. 29	30,529	81	164	7 Ch	0.06
Mar. 30	39,284	104	162	7 Ch	0.07
Apr. 4	47,894	132	209	12 Ch	0.14
Apr. 7	34,053	110	175	7 Ch	0.12
Apr. 13	34,105	96	221	10 Ch	0.12
Apr. 17	56,283	153	290	10 Ch	0.12
Apr. 19	33,104	85	147	5 Ch	0.10
Apr. 21	30,697	89	195	4 Ch	0.07
Apr. 24	46,678	126	160	6 Ch	0.07
June 6	30,598	58	68	5 DF	0.01
June 7	33,161	54	63	5 DF	0.02
June 8	33,632	58	65	5 DF	0.01
June 9	35,473	65	72	5 DF	0.02
June 10	34,910	61	72	5 Ds	0.06
June 11	39,136	71	86	5 Ds	0.03
June 12	50,959	103	144	8 SF	0.03
June 13	51,117	107	133	5 G	0.03
June 14	40,106	77	119	5 Ds	0.03
June 21	45,285	97	115	5 Ch	0.06
June 23	46,667	111	222	10 Ch	0.05
Sept. 20	37,595	89	105	4 Ch	0.05
Oct. 9	32,479	81	143	6 Ch	0.05
Nov. 1	39,478	108	161	6 Ch	0.14
Dec. 11	70,587	201	370	20 Ch	0.12
1969					
Jan. 16	30,765	74	422	18 Ch	0.17
Jan. 21	40,649	109	169	12 Ch	0.18
Jan. 22	44,337	123	159	10 Ch	0.14
Jan. 23	87,396	244	557	20 Ch	0.25
Jan. 24	43,957	122	296	10 Ch	0.22
Jan. 25	31,062	87	231	10 Ch	0.16

FIGURE I-1



MAXIMUM ACTIVATED CARBON USAGE
SOUTH WATER FILTRATION PLANT
1958-1968

DEPARTMENT OF WATER & SEWERS
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CITY OF CHICAGO

JANUARY 31, 1969

TABLE I-2
ANNUAL CONSUMPTION OF ACTIVATED CARBON COAGULANTS (ALUM FERROUS SULFATE), AND CHLORINE

1958 - JANUARY 31, 1969

YEAR	ACTIVATED CARBON TOTAL #	 #/MG	COAGULANTS TOTAL #	 #/MG	CHLORINE TOTAL #	 #/MG	TOTAL WATER TREATED (MIL GAL)
1958	2,762,540	22	13,705,336	108	2,172,687	16.9	127,478.9
1959	3,035,509	23	14,259,529	108	1,982,719	14.9	131,988.6
1960	2,727,005	21	14,104,178	106	2,545,043	18.9	133,198.4
1961	2,632,923	21	16,088,039	126	2,461,640	19.3	127,603.5
1962	2,865,541	21	15,520,647	117	2,573,491	19.3	132,993.5
1963	3,194,443	23	16,509,311	118	2,898,487	20.7	139,993.5
1964	3,766,446	27	14,627,505	104	3,046,756	21.6	141,096.0
1965	3,094,606	23	14,279,870	104	2,797,986	20.4	136,894.8
1966	4,678,661	33	16,445,820	116	3,518,720	24.8	142,083.8
1967	4,455,273	32	15,778,872	112	3,388,261	24.0	141,106.9
1968	4,876,309	33	15,907,820	109	3,215,810	21.3	146,166.0
JAN. 1969	538,793	48	1,125,284	100	182,652	16.1	11,247.0
TOTAL	38,628,049		168,352,211		30,694,252		1,511,850.9
AVERAGE	3,486,286	26	15,194,243	111	2,770,239	20.3	136,488.6

any value for the previous 11 years and also is higher than the overall average value of $2.05/mil gal. The 1968 costs of coagulants ($2.07 mil gal) is of the same order of magnitude of the previous two years and slightlv higher than the overall average for the 11-year period. The cost of chlorine ($1.00/mil gal) is equally less than the previous two years but is higher than the overall average of $0.95/mil gal for the 11-year period and one month. In Table I-4, we have listed the contract prices per ton for alum, carbon and chlorine, as delivered to Chicago's two water filtration plants. It is noted **that** the price of alum has risen from $39.95 in 1965 to $43.45 per ton in 1968. Activated carbon, which remained constant for many years, has risen from a cost of $156.70 a ton in 1965 to $178.60 a ton in 1968. Chlorine has risen from the low point of $83.20 per ton in 1965 to the cost of $93.40 per ton in 1968. While these increases in prices are significant, they are only a part of the reasons for the increases in the total cost of chemical treatment as outlined above.

TABLE I-3

SUMMARY OF COSTS: ACTIVATED CARBON, COAGULANTS (ALUM, FERROUS SULFATE) AND CHLORINE

1958 - JANUARY 31, 1969

	ACTIVATED CARBON		COAGULANTS		CHLORINE		TOTAL WATER TREATED
YEAR	TOTAL $	$/MG	TOTAL $	$/MG	TOTAL $	$/MG	(MIL GAL)
1958	215,723.57	1.69	231,346.94	1.81	105,098.08	0.82	127,478.9
1959	237,432.07	1.80	253,823.36	1.92	96,308.97	0.73	131,988.6
1960	213,435.65	1.60	329,818.94	1.80	121,546.69	0.91	133,198.4
1961	206,742.88	1.62	281,796.83	2.21	117,688.60	0.92	127,603.5
1962	230,698.90	1.74	274,973.31	2.07	120,121.66	0.90	132,993.5
1963	253,981.84	1.82	304,475.38	2.17	129,379.43	0.93	139,993.5
1964	296,684.97	2.10	272,187.75	1.93	140,934.75	1.00	141,096.0
1965	243,055.45	1.78	268,806.52	1.96	122,776.01	0.90	136,894.8
1966	361,222.18	2.54	303,788.28	2.14	162,470.73	1.14	142,083.8
1957	368,913.81	2.61	293.547.31	2.08	167,047.76	1.18	141,106.9
1968	415,789.00	2.86	304,206.00	2.07	146,122.00	1.00	146,186.0
JAN. 1969	48,114.00		20,662.00		8,530.00		11,247.0
TOTAL	3,091,794.32		3,139,432.62		1,438,024.68		1,511,870.9
AVERAGE	279,043.81	2.05	283,252.04	2.07	129,785.62	0.95	138,000.0

TABLE I-4
CONTRACT PRICES PER TON
CENTRAL AND SOUTH FILTRATION PLANTS
1958 - JANUARY 31, 1969

	CHEMICAL		
YEAR	ALUM (LIQUID)	CARBON	CHLORINE
1958	$39.07	$156.18	$96.74
1959	40.84	156.44	97.15
1960	40.86	156.53	95.54
1961	40.96	157.04	95.62
1962	41.35	161.01	92.94
1963	40.79	159.01	89.27
1964	41.30	157.24	92.24
1965	39.95	156.70	83.20
1966	40.55	156.70	95.20
1967	41.85	166.60	97.20
1968	43.45	178.00	93.40

DEPARTMENT OF WATER AND SEWERS - CITY OF CHICAGO TABLE I-5
CONTROL POINT - OPEN WATER
SOUTH WATER FILTRATION PLANT
COMPARISON OF ACTUAL RESULTS WITH WATER QUALITY CRITERIA GOALS
1965 - THROUGH JANUARY 31, 1969

LEGEND:
(Not more than
) Not less than

PARAMETER	QUALITY CRITERIA		ANNUAL EXCEEDING DAILY AVERAGE 1965	1966	1967	1968	Jan. 1969	EXCEEDING SINGLE VALUE 1965	1966	1967	1968	Jan. 1969
Coliform Bacteria	Annual Avg.	(200										
(MPN/100 ml)	Daily Avg.	(2,500	2/365	0/364	6/364	0/360	0/31					
Fecal Streptococci												
(Number/100 ml)	Single Day	(25						14/127	4/294	8/339	7/359	0/31
True Color	Annual Avg.	(5										
(units)	Single Day	(15						0/1	0/218	0/309	0/322	0/25
Threshold odor (Hydro-								4/365	37/365	23/365	14/366	6/31
carbon and/or Chemical)	Daily Avg.	(4	7/365	52/365	35/365	22/366	8/31					
Temperature (°F)	Single Day	85						0/365	0/344	0/365	0/365	0/31
PH	Annual Range	8.1-8.4										
(Units)	Daily Range	7.7-9.0	0/365	0/364	0/365	0/365	0/31					
Dissolved Oxygen	Annual Avg.	) 90										
(Percent Saturation)	Single Day	) 80						2/4	0/10		0/0	0/0
Ammonia Nitrogen	Annual Avg.	(0.02										
(MG/L)	Daily Avg.	(0.05	26/365	43/365	67/365	8/366	7/31					
Methylene Blue (Active	Annual Avg.	(0.05										
Substance) (MG/L)	Single Day	(0.20						0/23	0/83	0/78	0/141	0/13
Chlorides	Annual Avg.	(8										
(MG/L)	Single Day	(15						0/170	0/281	1/340	0/360	0/31
Cyanides (MG/L)	Single Day	(0.025						0/28	0/11	0/18	0/36	0/4
FLUORIDES	Annual Avg.	(1.0										
(MG/L)	Single Day	(1.3						0/227	0/277	0/339	0/365	0/31
Dissolved Iron	Annual Avg.	(0.15										
(MG/L)	Single Day	(0.30						0/79	0/271	0/340	0/363	0/31
Phenol Like Substances	Annual Avg.	(0.001										
(MG/L)	Single Day	(0.003						48/74	224/272	9/198	16/261	2/31
Sulfates	Annual Avg.	(23										
(MG/L)	Single Day	(50						0/149	0/272	0/345	0/358	0/31
Total Phosphates	Annual Avg.	(0.03										
(MG/L)	Single Day	(0.04						34/166	43/266	222/337	239/362	24/31
Filterable Residue	Annual Avg.	(162										
(MG/L)	Single Day	(200						0/4	0/98	0/102	0/253	0/22

NUMBER OF DAYS EXCEEDING CRITERIA / NUMBER OF DAYS TESTFD

J. C. Vaughn

Federal Water Pollution Control Administration Parameters Exceeded at SWFP

In Table I-5, which has listed the number of days tested and the number of days in which the established parameters were exceeded for 17 of the 24 parameters adopted by the FWPCA Conference for the southern end of Lake Michigan and the Calumet area in January 1966. The values for the years 1965, 1966 and 1967, we have added the values for 1968. During 1968, the coliform bacteria did not exceed the daily average value of 2500/100 mil on any day of the days tested. The fecal streptococci in 1968 exceeded the base standard of 25/100 ml on 7 days of 359 days tested. The threshold odor in 1968 exceeded the single days value of 8 on 14 days of 366 days tested and the daily average value of 4 on 22 of 366 days tested. In January 1969 the value of 8 was exceeded 6 out of 31 days tested and the daily average of 4 was exceeded 8 out of 31 days tested. The ammonia nitrogen exceeded the daily average value of 0.05 ppm on 8 days of 366 days tested, and 7 out of 31 days tested in January 1969. The total phosphates exceeded the single days value of 0.04 ppm on 239 days out of 362 days tested in 1968 and 24 out of 31 days tested in January 1969. It is significant that the values exceeding the basic parameters most often are those contributing to algal nuisances (namely, ammonia nitrogen and total phosphates) and taste and odor problems (namely, threshold odors and phenol-like substances).

Conclusions:

There has been no improvement in the one parameter that is largely responsible for the increase in the cost of the chemical treatment of water at the South Water Filtration Plant. While the increase in the use of activated carbon during the year 1968 and through January 1969 is attributable in part to increased plankton-caused, tastes and odors, by far the largest portion of the increase is due to the presence of hydrocarbon wastes in the water. The increase in the price of the three principal chemicals (carbon, coagulants, chlorine) the use of which is affected by the pollution load and is also a factor in the increased overall chemical cost, but not a significant one. The extremely high values of ammonia nitrogen in the discharge from the IHSC is an extremely disturbing situation. Until there is an appreciable reduction in the amount of pollutants that cause 1) an increase in plankton nuisances and 2) an increase in tastes and odors due to industrial wastes, there can be no conclusion that there has been a significant improvement in raw water quality in the southern end of Lake Michigan.

MR. STEIN: Are there any comments or questions?

MR. POOLE: Well, Mr. Chairman, I think I am compelled to comment that what Mr. Vaughn said is pretty much a replay of the December Illinois-Indiana Conference. Twenty minutes ago Mr. Klassen was contending the Illinois industries that were involved in that Conference were not within the jurisdiction of this one.

MR. KLASSEN: That is correct. And at that time I asked for any information. The Federal Government itself didn't show that the wastes in the Calumet River were causing any interstate pollution or pollution of Lake Michigan. If anybody has any of that data, I would like to have it. Mr. Bowden made that statement.

MR. POSTON: Well, I think Mr. Bowden indicated that ammonias were high at the Central District filtration plant, and whether this came from the Calumet River or whether it came from down Indiana way several miles further down the lake I think might be very difficult to show exactly.

But the Conferees did agree that pollution from the Calumet River interfered down lake and pollution from Indiana influenced up the lake.

MR. KLASSEN: I think Mr. Bowden's report of analyses showed that the water quality criteria were being met just outside the mouth of the Calumet River, and if there is any other data that the Federal Government has that the Calumet River is causing interstate pollution, we would like to see it because we haven't seen any of it.

MR. POSTON: I will be very happy to show you some information relative to oil pollution which is very visible in the Calumet Harbor area and it is visible on the Calumet River. I would say that almost any day you go down there you can see this, particularly if you get an overview of it, it is very evident. And that is only one of the parameters. I will see that you get a compilation of information on this subject.

MR. STEIN: Well, I--go ahead, Mr. Klassen.

MR. KLASSEN: I just was thanking him for the offer.

MR. STEIN: I guess we are going to persist on this.

Again let me try to put this the way I see this problem.

Mr. Vaughn has made some very excellent comments, and I would like to talk to him--ask him a question on one problem a little later. But here is the situation.

Presumably, we have a large remedial program under way. Mr. Vaughn indicates that there are two areas in the plankton nuisances--an increase in taste and odors during discharge of industrial wastes and they are still having very significant problems in the waterworks intake. Again we have a technical committee and a monitoring group working. I think the record has indicated that due to the waste amounts of industrial and municipal pollutants which were coming out we often had these sources masked by these tremendous loads of pollutants. It was very difficult to determine where they came from. As the cleanup program works, we are going to have to determine, if we are going to give Mr. Vaughn any relief at the water intake and improve water quality in that sense, precisely where this material comes from and pinpoint it and work at it with a scalpel.

Now, anyone can contend that it comes from a variety of sources. It may come from them, a combination of them or none of them. But I think until we follow this in an evidentiary manner, we can sit here and speculate and talk on jurisdiction from now to Kingdom come, but we are not going to be able to spotlight this and correct it.

This is the task and the all-important job we assigned that technical committee when we set this program up in 1965, and I might say using the best judgment we had. Its purpose was to determine precisely where the waste sources were which contribute to these problems. Once we find that, then we hope we can define methods of dealing with them.

I recognize as these plants go on line in this period this becomes a very tender subject and we are switching on this. But we have to persist and proceed in an orderly manner. Also we must recognize that our major program of getting these vast municipal and industrial waste treatment works on the line must go forward.

I would like ask you one question, Mr. Vaughn. Dealing with the chlorides, you say we have to think about those. As populations grow--we get more people--and we have not much water, how do you get the chlorides out? What do you say is the question here?

MR. VAUGHN: My point of view there is not how do we get it out of the water, but we should consider keeping it from going in.

MR. STEIN: That is right. But you know, if you--

MR. VAUGHN: It is going to increase. The 100-year story indicates that it has more than doubled in the 100 years.

MR. STEIN: Right.

MR. VAUGHN: In fact, it has more than doubled in 30 years.

MR. STEIN: Again I think--

MR. VAUGHN: And I don't expect there is any way that we can get it out readily, but we can certainly slow down the additional pollutants that will increase it.

MR. STEIN: Right. I hope you can do that. This is precisely the kind of thing that we are getting into in pollution control now. I suspect it is going to get more and more technical. As you begin to zero in on a taste- and odor-producing material which causes planktonic nuisances, ammonias and chlorides, if we identify them as a problem, we will have to have fairly sophisticated methods to deal with keeping them out. Now, if you want certain water quality and have to soften it for manufacturing processes, with the ever-increasing problem of more people being around, you are going to have the attendant problem of a lot more of these chlorides being produced. This is going to be a real problem.

You have to recognize that Mr. Vaughn

puts out a very palatable water supply in Chicago, and I don't say this in any manner other than something that is well considered. The kind of chlorides that other people in other parts of the country tolerate in their drinking water would probably make the little hair you have left stand up on your head.

But the point is, we do have, as industries and people increase, these increases in chlorides.

Now, again, I ask for everyone to really look at this carefully and look at the kind of problem we are facing. Starting with analyses such as Mr. Vaughn has made, we are going to have to come up in the future with a monitoring program which will lead us to finding a cause. This is easy to say but it is not easy to do. The purpose will be 1) to find precisely what is causing this problem; 2) where it is coming from, which is not at all easy to do, and 3), which may be the most difficult of all, once you have discovered that, what to do about it.

Now, I do not want to say at this point that we are able to do any of those three. We cannot determine, except by an educated guess, what increases in taste and odors are due to industrial wastes. We surely don't know how they are getting there, precisely, I mean from what pipe they are coming, where they are going in and getting there. And the next thing, we don't know, once we get them, how to keep them out.

I would suspect that if we find certain minute quantities of industrial wastes causing that, that is going to be the easiest to control once we find the source. The question of effects on pollutants that might increase plankton or the salts or sulfates that Mr. Vaughn talks about may be another dish of tea, and I am not sure, even once we find this, that we are going to be able to get the remedial measures.

This is what we are working on, and I think this is useful, because this spotlights the kind of future water pollution control and sophisticated measures we are going to have to take if we are going to clean this up.

One of the things that I am very much interested in is your bacterial counts--that they were within the limits. Now, again, sometimes when you listen to the sad tale you don't know how much we have progressed, because it wasn't too many years ago when we used to come out here on one of these real, real touchy type meetings every summer to look at the beaches and determine whether they could be safely opened or whether we would have to recommend closing the beaches.

To give you the kind of impact that this has, when we were in New York two years ago, it was recommended that all the Staten Island beaches be closed and half of Coney Island. We avoided that here, and the point is that by and large we were within the biological limits. Although Mr. Klassen indicated with the new stricter criteria there were some violations, and we have to work on that.

But I think we have to recognize that we have made in many of these areas considerable progress. Again, I plead that we keep this in perspective because what Mr. Vaughn is pointing out is the new kinds of programs we must get into.

One last word. If we are going to get to the kind of problem that Mr. Vaughn talks about. we are going to have to do a monitoring, a detection and a cleanup program in a sophisticated way that has practically never been done on any mass scale. We have done that when we traced, or at least we think we did, a pesticide down the Missouri River or where you get a radioactive material and you really have a problem of tracing. But in a complicated metropolitan area, we have never got to these refined points and traced all these things out to the myriad sources. The advantage of our doing this other sophisticated tracing--and I am just talking the advantage from an evidentiary sense, we found maybe one or two sources. What you are going to have to deal with is the complexity of possible sources in a metropolitan area, and this is going to be very difficult.

Are there any other comments or questions?

If not, thank you.

Mr. Vaughn.

MR. VAUGHN: May I make one final statement--that our feeling is that the comparatively low values for chloride and sulfate should not be considered a license to pollute.

MR. STEIN: I agree with that. You have

completely philosophically--you know, when we started on the radioactive pollutants once, when we got to radium in water, what had happened was that we found that they had a maximum permissible limit--they got it down to about 10. Then we began pushing and the Public Health Service came out with three picocuries, this is, in all cases, in the drinking water standards. When we got down to three in the Colorado River, the people said, "Here we are meeting drinking water standards, isn't that enough?" And we said, no, we think you should go as close to background as possible to give you the safety factor. Now we have got it down to one in the Colorado River. And I would agree with Mr. Vaughn that as far as the addition of chlorides or any of these other materials, I would like to go down as low as we possibly can, no question.

Thank you.

MR. KLASSEN: Thank you, Jim.

Mr. Chairman, just a very brief statement from Mr. Pavia, the Chicago Department of Water and Sewers. It is always good--you hear a lot about ordinances and rules and regulations being passed. The City of Chicago took the lead in this and Mr. Pavia is going to give a brief description of how it is or was.

STATEMENT BY RICHARD A. PAVIA
ASSISTANT COMMISSIONER OF WATER AND SEWERS
DEPARTMENT OF WATER AND SEWERS, CHICAGO, ILLINOIS

MR. PAVIA: Mr. Klassen, thank you very much.

With your plea to make it brief, I would like to submit the entire paper, but I will only read the portion of the paper particularly germane to the Conference.

MR. STEIN: Without objection, the paper will be entered into the record as if read.

MR. PAVIA: Mr. Chairman, Conferees, distinguished officials, ladies and gentlemen.

You may recall that when this Conference first convened in January and February of 1968, we reported to you that the city of Chicago had passed a Harbor Pollution Control Ordinance on September 28, 1967. In the absence of Federal and State regulations for controlling wastes from watercraft, Mayor Richard J. Daley had directed that the city take action to protect the Lake Michigan shoreline from this source of pollution. With passage of the new law, the city immediately embarked upon a program which would enable both pleasure craft owners and commercial shippers to comply.

I will skip the next portion here and get into some of the result that our District experienced in 1968.

Relative to operating experience, it would be appropriate to mention that by the middle of June 1968 the Chicago Park District had completed and placed in operation nine shore disposal stations at a cost of $136,000. The Park District provides moorings for 2,400 boats and launching permits for an additional 1,800 craft. Each of the seven Park District marinas has at least one disposal facility. These pumping stations discharge to the city sewerage system so that all wastes are processed through waste treatment plants and receive the same degree of treatment as domestic sewage. The effluent from these plants, as you know, is not returned to Lake Michigan.

The pumps used by the Chicago Park District are a self-priming diaphragm type driven by either gasoline or electric motors. They deliver approximately 55 gallons per minute at a 20 foot head and are capable of handling 2-1/4 inch solids. The suction hoses are 75 to 100 feet long and are equipped with a tapered plastic suction nozzle designed for friction fit in a 1-1/2 inch diameter pipe. This eliminates the need to connect a screwed fitting to evacuate a holding tank. The suction nozzle includes a molded integral check valve. This type connection which is both fast and sanitary eliminates some of the operating difficulties and permits discharge fittings on boats to be flush with the hull.

At Chicago's other lakefront marina, the Monroe Street Harbor, a different type of problem was encountered. This harbor is classified as a Federal anchorage, and approximately 750 boats are moored here annually under permits issued by the U. S. Coast Guard. This marina is located in an area not presently sewered and where the responsibility for providing such sewerage is questionable. Although this is not a city facility, the Department of Port arranged for a barge equipped with pumps and tanks to be stationed in the harbor and provide disposal services. This was an expensive and temporary solution. Efforts are currently underway to arrange for cooperative financing of a sewer to serve this area.

We are pleased to report that in spite of the problems inherent in implementing a new program and the specific problems previously outlined, the results were encouraging. Spot checks by the Chicago Park District and the Marine Unit of the Chicago Police Department indicated a high degree of compliance by pleasure craft owners. At the close of the boating season the Chicago Park District reported that approximately seventy-five percent (75%) of the pleasure craft in the Park District's seven marinas utilized systems in which no overboard discharge was required. The majority of the others either removed or sealed their toilet facilities.

The Chicago Harbor Pollution Ordinance is not limited to pleasure craft. Therefore, provisions to accommodate some 700 overseas vessels and 2,400 domestic lake carriers was needed. To complicate matters, holding tanks, while practical for small pleasure craft, are not as attractive for large vessels. Existing plumbing systems in large ships frequently have several locations for overboard discharge and centralization is costly. Also large holding tanks require valuable cargo capacity. As a result, the large overseas vessels, by and large, resorted to the installation of temporary toilet facilities if they were destined to visit Chicago. Such facilities were leased from marine sanitation companies and placed aboard when the ship entered the St. Lawrence Seaway. These facilities were serviced as required while the ships were in the Great Lakes and later removed when the vessels left the Seaway. Inspections carried out by the Chicago Board of Health and Port Director indicated that approximately 90 percent of the overseas vessels checked were found to be in compliance. During 1968 inspections were limited to vessels using Navy Pier and the port at Lake Calumet.

The Water Quality Surveillance Section of the Department of Water and Sewers conducts an extensive water sampling program. A comparison of test results from water samples taken from the lakefront marinas in 1967 and 1968 indicate to some extent the effectiveness

R. A. Pavia

of this ordinance. Bacteriological tests of harbor waters in 1968 indicated that coliform and fecal streptococci levels were in conformance with the Illinois Sanitary Water Board and Federal shore water standards for Lake Michigan. In 1967, the specified limits were often exceeded. Chemical tests also showed better water quality in 1968. While the standards for shore water as indicated by ammonia nitrogen, which is listed as 0.12 of a part per million daily limit, were exceeded upon occasion in 1968, this condition occurred less frequently than in 1967.

So much for past performance. With the 1969 boating season fast approaching, we are currently making plans to improve the pollution abatement program. The Chicago Park District is considering the assignment of seasonal staff to operate the pump-out facilities rather than relying upon last year's self-service operations. Arrangements are also being made to increase both inspection and enforcement activities. The Park District's Director of Special Services has already notified permit holders that the ordinance will be enforced and boats not complying will not be permitted in the harbors. Even though the regulations proposed by the four States represented at this Conference aren't scheduled to become effective until 1970, we are hopeful that owners and operators of marinas on Lake Michigan will proceed with the installation of shore disposal facilities this year. As you know, interstate travel by pleasure boats is becoming more common every year and adequate sanitation services should be readily available.

We are gratified that the Conference has seen fit to take action on this problem and feel that the results of this joint program to control wastes from watercraft will prove of great future benefit in improving the quality of Lake Michigan's shore waters.

I might add that this group here might want to watch the status of Senate Bill 7, which is a new bill introduced in this Session of the Congress and which includes a number of provisions for controlling wastes from watercraft. If this bill passes, as we hope it will, it will greatly assist the Conferees here in carrying out this program on Lake Michigan.

Thank you.

(The following is the document submitted by Mr. Pavia:)

STATEMENT BY RICHARD A. PAVIA
ASSISTANT COMMISSIONER OF WATER AND SEWERS
DEPARTMENT OF WATER AND SEWERS - CHICAGO
BEFORE THE FOUR STATE WATER POLLUTION CONFERENCE
ON LAKE MICHIGAN - FEBRUARY 25, 1969

Re: Progress Report on the City of Chicago's Harbor Pollution Ordinance.

Mr. Chairman, Conferees, distinguished officials, ladies and gentlemen:

You may recall that when this Conference first convened in January and February of 1968, we reported to you that the city of Chicago had passed a Harbor Pollution Control Ordinance on September 28, 1967. In the absence of Federal and State regulations for controlling wastes from watercraft, Mayor Richard J. Daley had directed that the city take action to protect the Lake Michigan shoreline from this source of pollution. With passage of the new law, the city immediately embarked upon a program which would enable both pleasure craft owners and commercial shippers to comply.

Since municipal jurisdiction in a lake as large as Lake Michigan is much too limited to do a complete job, Chicago continued to urge the enactment of Federal or regional regulations. We were pleased when all four Conferees representing the States bordering Lake Michigan, last February, agreed to adopt uniform regulations for controlling wastes from watercraft. This action was accomplished when a "Proposed Act for Disposal of Sewage from Marine Toilets" was approved by all Conferees on April 10, 1968. The proposed act, which is scheduled to become effective in all four States on January 1, 1970, is similar to and compatible with the Chicago Harbor Pollution Ordinance.

The purpose of our report today is to acquaint you with the experience we gained during the first year in which the Chicago ordinance was in effect. It is hoped that this experience might provide information useful in avoiding some of the problems we encountered.

First of all, you might anticipate problems of jurisdictional responsibility. In Chicago, four city agencies, namely, the Chicago Board of Health, the

Department of Port, the Police Department and the Department of Water and Sewers are all directly concerned with harbor pollution along with the Chicago Park District, a separate governmental entity. The Illinois Sanitary Water Board, the U. S. Coast Guard, the Army Corps of Engineers, and the Federal Water Pollution Control Administration were consulted. In many cases, the areas of legal authority are not clearly defined or may be overlapping. Under such conditions it is possible that questions of policy will result in conflicting or confusing interpretation and enforcement. Before the Chicago ordinance was passed, each of the aforementioned local agencies was consulted. After passage, a Technical Advisory Committee, with broad representation, was established to advise the Port Director who, by the ordinance, is responsible for administration. This allows the Port Director to draw upon technical knowledge not available within his own Department. The Committee also serves as a forum useful in resolving operating problems and reviewing the acceptability of pollution control devices. This approach was quite successful. During the entire boating season of 1968, not one question of jurisdiction arose among local agencies.

At the time the ordinance was first passed, some opposition was voiced by boating and shipping groups. Boat owners, unsure of the meaning of the ordinance and how it would be enforced expressed concern that the pollution control equipment required would restrict use of the boat's sanitary facilities outside of Chicago waters. To overcome this problem representatives of various boating associations were invited to participate at meetings of the Technical Advisory Committee. As a result, the city received valuable advice and has enjoyed a high degree of cooperation.

Relative to operating experience, it would be appropriate to mention that by the middle of June 1968 the Chicago Park District had completed and placed in operation nine shore disposal stations at a cost of $136,000. The Park District provides moorings for 2,400 boats and launching permits for an additional 1,800 craft. Each of the seven Park District marinas has at least one disposal facility. These pumping stations discharge to the city sewerage system so that all wastes are processed through waste treatment plants and receive the same degree of treatment as domestic sewage. The effluent from these plants, as you know, is not returned to Lake Michigan.

The pumps used by the Chicago Park District are a self-priming diaphragm type (Gorman-Rupp Co.) driven by either gasoline or electric motors. They deliver approximately 55 gallons per minute at a 20 foot head and are capable of handling 2-1/4 inch solids. The suction hoses are 75 to 100 feet long and are equipped with a tapered plastic suction nozzle designed for friction fit in a 1-1/2 inch diameter pipe. This eliminates the need to connect a screwed fitting to evacuate a holding tank. The suction nozzle includes a molded integral check valve. This type connection which is both fast and sanitary eliminates some of the operating difficulties and permits discharge fittings on boats to be flush with the hull.

At Chicago's other lakefront marina, the Monroe Street Harbor, a different type of problem was encountered. This harbor is classified as a Federal anchorage, and approximately 750 boast are moored here annually under permits issued by the U. S. Coast Guard. This marina is located in an area not presently sewered and where the responsibility for providing such sewerage is questionable. Although this is not a city facility, the Department of Port arranged for a barge equipped with pumps and tanks to be stationed in the harbor and provide disposal services. This was an expensive and temporary solution. Efforts are currently underway to arrange for cooperative financing of a sewer to serve this area.

We are pleased to report that in spite of the problems inherent in implementing a new program and the specific problems previously outlined, the results were encouraging. Spot checks by the Chicago Park District, and the Marine Unit of the Chicago Police Department indicated a high degree of compliance by pleasure craft owners. At the close of the boating season the Chicago Park District reported that approximately seventy-five percent (75%) of the pleasure craft in the Park District's seven marinas utilized systems in which no overboard discharge was required. The majority of the others either removed or sealed their toilet facilities. Judging from the number of inquiries received from the general boating public a genuine effort was made to fully satisfy the new law. From this experience we would recommend that when the regulations of all four Lake Michigan States become effective, that some means be made available for boaters to get their individual questions answered from authoritative sources.

The Chicago Harbor Pollution Ordinance is not limited to pleasure craft. Therefore, provisions to accommodate some 700 overseas vessels and 2,400 domestic lake carriers was needed. To complicate matters, holding tanks, while practical for small pleasure craft, are not as attractive for large vessels. Existing plumbing systems in large ships frequently have several locations for overboard discharge and centralization is costly. Also large holding tanks require valuable cargo capacity. As a result, the large overseas vessels, by and large, resorted to the installation of temporary toilet facilities if they were destined to visit Chicago. Such facilities were leased from marine sanitation companies and placed aboard when the ship entered the St. Lawrence Seaway. These facilities were serviced as required while the ships were in the Great Lakes and later removed when the vessels left the Seaway. Inspections carried out by the Chicago Board of Health and Port Director indicated that approximately 90 percent of the overseas vessels checked were found to be in compliance. During 1968 inspections were limited to vessels using Navy Pier and the Port at Lake Calumet.

The Water Quality Surveillance Section of the Department of Water and Sewers conducts an extensive water sampling program. A comparison of test results from water samples taken from the lakefront marinas in 1967 and 1968 indicate to some extent the effectiveness of this ordinance. Bacteriological tests of harbor waters in 1968 indicated that coliform and fecal streptococci levels were in conformance with the Illinois Sanitary Water Board and Federal shore water standards for Lake Michigan. In 1967, the specified limits were often exceeded. Chemical tests also showed better water quality in 1968. While the standards for shore water as indicated by ammonia nitroger (0.12 mg/l daily limit) were exceeded upon occasion in 1968, this condition occurred less frequently than in 1967.

So much for past performance--with the 1969 boating season fast approaching, we are currently making plans to improve the pollution abatement program. The Chicago Park District is considering the assignment of seasonal staff to operate the pump-out facilities rather than relying upon last year's self-service operations. Arrangements are also being made to increase both inspection and enforcement activities. The Park District's Director of Special Services has already notified permit holders that the ordinance will be enforced and boats not complying will not be permitted in the harbors. Even though the regulations proposed by the four States represented at this conference aren't scheduled to become effective until 1970, we are hopeful that owners and operators of marinas on Lake Michigan will proceed with the installation of shore disposal facilities this year. Interstate travel by pleasure boats is becoming more common every year and adequate sanitation services should be readily available.

The prospect for Federal legislation is also encouraging. Following the failure of Congress to pass Senate Bill 3206 (Water Quality Act of 1968) with its provisions covering control of wastes from watercraft, a new bill, Senate Bill 7, was introduced this Session. This Bill, entitled the Water Quality Improvement Act of 1969, 's co-sponsored by Senator Edmund Muskie and is intended to, among other provisions, provide for control of sewage from vessels. This Bill, as we interpret it, would apply to boats of every description. pleasure craft as well as commercial vessels, and compliment the proposed action approved by this Conference. Inasmuch as Senate Bill 7 would cover vessels engaged in interstate commerce, it could strengthen regulations for controlling wastes from watercraft on Lake Michigan. However, we think it important that the proposed Federal regulations governing the performance for marine sanitation devices be established in such a way as to satisfy existing Federal Water Quality Standards. This means that overboard discharges, if permitted, should be allowed only after high order waste treatment. Under the terms of this Bill, these questions will be decided by the Secretary of Interior in conjunction with the Secretary of the Department in which the Coast Guard is operating.

Finally, allow me to say in closing that these remarks were intended to give a brief outline of Chicago's experience based upon one year of operation.

R. A. Pavia

This discussion was brief and specific details have been omitted to conserve your time. However, should you wish more detailed information regarding this ordinance, our experience to date, or equipment specifications, we would be happy to make such data available.

We are gratified that this Conference has seen fit to take action on this problem and feel that the results of this program to control wastes from watercraft will prove of great future benefit in improving the quality of Lake Michigan's shore waters.

Excerpts From

CHAPTER 38

MUNICIPAL CODE

CITY OF CHICAGO

PERTAINING TO HARBOR POLLUTION

City of Chicago
Richard J. Daley, Mayor
Dept. of The Port of Chicago
Executive Offices - Navy Pier
Chicago, Illinois 60611

January 1, 1968

R. A. Pavia

The city of Chicago is most proud of its long record of accomplishments with regard to preventing pollution of Lake Michigan, and thereby preserving in large measure the future of this valuable resource for water supply, a prime source of recreation in the Midwest, and Chicago's most important physical asset. Because of its location on the shores of Lake Michigan, at the junction of the St. Lawrence Seaway and Illinois-Mississippi inland waterway, the city of Chicago has been and will continue to be vitally concerned with and influenced by water management activities.

In support of these objectives, it shall be the policy of the city of Chicago that pollution of Lake Michigan will not be tolerated. Regulations designed to support this policy have been prepared, and the administration and enforcement of these controls will be of prime concern to appropriate city agencies.

The Federal Government, the States bordering on the Great Lakes and the city of Chicago have taken positive action in establishing programs for the prevention, regulation and abatement of water pollution, bacterial, chemical and physical, and including solid waste emanating from municipalities and industries bordering the shore of Lake Michigan. The provisions of the Municipal Code of Chicago, State and Federal regulations and statutes, all prohibit the fouling of the waters of Lake Michigan, and the enforcement of provisions designed to prevent the pollution of the waters and harbors of Chicago by vessels, both foreign and domestic, private and commercial, as well as pleasure craft, and land extensions which contribute to the pollution of Lake Michigan, are judged to be essential in order to preserve the health, welfare and safety of citizens of Chicago and all residents of the Great Lakes region.

The following regulations are established in accordance with the provisions of Chapter 38, Sections 8, 9 and 10 of the Municipal Code, the enforcement of which rests with the Director, Department of the Port of Chicago.

A. Definitions as Stipulated in Paragraph #38-1 of Chicago's Municipal Code.

Chicago Harbor.

> The harbor shall consist of the Chicago River and its branches to their

respective sources and all slips adjacent to and connecting therewith, the Ogden Canal, the Calumet River and its branches and all slips and basins connected therewith and all piers, breakwaters, and permanent structures therein, the Drainage Canal and all piers and basins, and the waters of Lake Michigan, including all breakwaters, piers, and permanent structures therein, for a distance of three miles from the shore between the north and south lines of the city extended, to the extent that the above-named waterways are within the territorial limits of the city.

Lake Michigan waters at Chicago.

This shall include the waters of Lake Michigan for a distance of three miles from the shore between the north and south lines of the city extended, the Calumet River and its branches and all slips connecting therewith, and the waters of Lake Calumet and all slips and basins connected therewith, to the extent that the above-named waterways are within the territorial limits of the city.

River Waters.

This shall include the Chicago River and its branches to their respective sources and all slips adjacent to and connecting therewith, the Ogden Canal, and the Drainage Canal, to the extent that the above-named waterways are within the territorial limits of the city.

Navigable streams regulated.

Any public stream which is or can be made usable for water commerce. These streams come under the jurisdiction of the United States Corps of Engineers.

B. Commercial vessels.

Any vessel, boat or ship operated for hire or in the commercial carriage of passengers and/or cargo or other commercial purposes.

C. Pleasure craft.

Any vessel, boat or ship privately

owned and operated for ordinary cruising, racing, water skiing or other recreational purposes.

D. Vessels of Local, State and Federal Agencies.

Any vessel, boat or ship publicly owned and operated by a local municipality, the State of Illinois or the U. S. Government.

E. Pollution.

Pollution shall mean the discharge or deposit in or upon such waters of sewage, industrial wastes, or other wastes containing soluble or insoluble solids of organic or inorganic nature which may deplete the dissolved oxygen content of such waters, contribute settleable solids that may form sludge deposits, contain oil, grease, or floating solids which may cause unsightly appearance on the surface of such waters, or contains soluble materials detrimental to aquatic life.

R. A. Pavia

ORDINANCE

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF CHICAGO:

SECTION 1. The Municipal Code of Chicago is amended by striking the existing Section 38-9 and inserting in lieu thereof a new Section 38-9 to read as follows:

> "38-9. No person shall throw, dump, place, deposit or cause or permit to be thrown, dumped, placed or deposited any pollutant as defined in Section 31-2.1 (k) of this Code, or any garbage, refuse, filth, putrid or unwholesome substance, or the contents of any toilet or head, catch basin, or grease trap upon the margin or banks, or within the limits or into the waters of the harbor. Discharge of any of the aforementioned pollutants within the radius of four miles of any domestic raw water intake is further expressly prohibited."

SECTION 2. The Municipal Code of Chicago is amended by adding the following new Section 38-9.1 to read as follows:

"38-9.1. In addition to the pollutants enumerated in Section 38-9 aforesaid, no operator of any vessel, craft, floats or motor boat shall discharge, dump or deposit into the harbor any fuel, solid or liquid, or the contents of any ballast tank, bilge tank or other receptacle capable of causing pollution of waters."

SECTION 3. The Municipal Code of Chicago is amended by adding the following new Section 38-9.2 to read as follows:

"38-9.2. All vessels, crafts, floats and motor boats equipped with toilets, heads, urinals, or capable of discharging galley wastes which have not been discharged through a grease trap or grease interceptor, or solid or liquid waste from shipboard hospital facilities, shall be equipped with a waste retention tank or approved type and capacity to store such waste material for subsequent disposal at a shoreside facility."

R. A. Pavia

SECTION 4. The Municipal Code of Chicago is amended by adding the following new Section 38-9.3 to read as follows:

> "38-9.2. A treatment system utilizing a method of waste treatment approved by the Port Director and complying with the Rules and Regulations Establishing Water Quality Criteria for Lake Michigan as set by the Illinois Sanitary Water Board may be permissible on vessels, craft, floats or motor boats operating in harbor waters in lieu of a retention tank. The effluent of any waste treatment system not meeting the approved standards of the Illinois Sanitary Water Board shall be discharged and collected in a retention tank while such vessel, craft, floats or motor boat is located or operating within the harbor of Chicago. All such waste retention tanks must be properly equipped with pumps and piping so that wastes can be discharged from a connection located above the water

line to approved shore-based or floating installations."

SECTION 5. The Municipal Code of Chicago is amended by striking Section 38-10 in its entirety and inserting in lieu thereof the following new Section 38-10:

"38-10. The Port Director shall have the authority to promulgate rules and regulations necessary to the effective control of harbor pollution.

"Any person who violates any of the provisions of Sections 38-8, 38-9, 38-9.1, 38-9.2 and 38-9.3 shall be fined not less than $50.00 nor more than $200.00 for each offense and each day's continuance or such violation shall constitute a separate offense."

SECTION 6. This ordinance shall be in force and effect from and after its passage and due publication.

Excerpts From

CHAPTER 38

MUNICIPAL CODE

CITY OF
CHICAGO

Pertaining To

HARBOR

WATER POLLUTION

CITY OF CHICAGO
RICHARD J. DALEY, *Mayor*
DEPT. OF THE PORT OF CHICAGO
Executive Offices — Navy Pier
CHICAGO, ILLINOIS 60611

January 1, 1968

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Any vessel, boat or ship privately owned and operated for ordinary cruising, racing, water skiing or other recreational purposes.

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E. Pollution.

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into the waters of the harbor. Discharge of any of the aforementioned pollutants within the radius of four miles of any domestic raw water intake is further expressly prohibited."

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SECTION 3. The Municipal Code of Chicago is amended by adding the following new Section 38-9.2 to read as follows:

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SECTION 4. The Municipal Code of Chicago is amended by adding the following new Section 38-9.3 to read as follows:

"38-9.3. A treatment system utilizing a method of waste treatment approved by the Port Director and complying with the Rules and Regulations Establishing Water Quality Criteria for Lake Michigan as set by the Illinois Sanitary Water Board may be permissible on vessels, craft, floats or motor boats operating in harbor waters in lieu of a retention tank. The effluent of any waste treatment system not meeting the approved standards of the Illinois Sanitary Water Board shall be discharged and collected in a retention tank while such vessel, craft, floats or motor boat is located or operating within the harbor of Chicago. All such waste retention tanks must be properly equipped with pumps and piping so that wastes can be discharged from a connection located above the water line to approved shore-based or floating installations."

SECTION 5. The Municipal Code of Chicago is amended by striking Section 38-10 in its entirety and inserting in lieu thereof the following new Section 38-10:

"38-10. The Port Director shall have the authority to promulgate rules and regulations necessary to the effective control of harbor pollution.

"Any person who violates any of the provisions of Sections 38-8, 38-9, 38-9.1, 38-9.2 and 38-9.3 shall be fined not less than $50.00 nor more than $200.00 for each offense and each day's continuance or such violation shall constitute a separate offense."

SECTION 6. This ordinance shall be in force and effect from and after its passage and due publication.

R. A. Pavia

GUIDELINES
FOR JUDGING THE
ACCEPTABILITY OF RETENTION
TANK EQUIPMENT

CHICAGO HARBOR POLLUTION CODE

CITY OF CHICAGO
RICHARD J. DALEY, Mayor
DEPT. OF THE PORT OF CHICAGO
Executive Offices - Navy Pier
CHICAGO, ILLINOIS 60611
May 1, 1968

PREAMBLE

The revised Chicago Harbor Pollution Code is intended to comply with Federal and State regulations relating to water quality standards for Lake Michigan. In essence, waste treatment devices making an overboard discharge must have an effluent (treated waste discharge) capable of satisfying the Water Quality Criteria outlined in SWB 7, a document issued by the Illinois Sanitary Water Board. This criteria is very rigid and as a result, difficult to achieve with existing marine type waste treatment devices. For this reason, a more practical solution would utilize a waste holding tank (retention tank) capable of holding all sanitary wastes for shoreside disposal at designated locations along the lakefront of Chicago.

In order that boat owners and operators may equip their vessels with proper facilities, the attached guidelines have been prepared. They are designed to cover holding devices with or without recirculation features. It is the intention of these rules that the contents of these holding tanks not be discharged into the lake or any waterway in this area. It should be further understood that no devices utilizing disposable containers such as plastic bags, treated paper containers, etc., are to be used. Use of containers of this type would be in direct violation of the law if disposed of overboard, and shoreside disposal stations are not equipped to handle these containers.

While the attached guidelines are intended to describe the types of devices acceptable to the Port Director, any individual, unsure of whether the device he desires to use is acceptable, may receive additional information by requesting approval from the Director of the Port of Chicago, Navy Pier, Chicago, Illinois 60611.

CHICAGO HARBOR POLLUTION CODE
GUIDELINES FOR JUDGING
THE ACCEPTABILITY OF RETENTION
TANK EQUIPMENT

Waste retention or holding tanks and their appurtenances will be considered basically acceptable to the Port Director if they meet the following standards:

1. They shall be constructed of a rigid material and if over ten gallon capacity be adequately baffled. Units, utilizing a receptacle consisting of a plastic bag, treated paper, or other easily compressed or folding material, intended to be disposable, will not be approved, and their use is prohibited.[a]

2. Materials used, including hose connections, shall be capable of resisting

corrosive action of chemicals intended for use in connection therewith, and the waste material to be deposited therein, as well as the corrosive action of fresh and/or salt water.

3. Materials used, including hose connections, shall be durable and structurally sound enough to withstand normal stress incident to installation, and operation of a vessel such as vibration, pitch, roll, shock, temperature and such other conditions of use normally encountered in watercraft operation.

4. Material used, and method of fabrication or construction of the tank, should be such as to prevent the leakage of its contents and the escape of any gases therefrom, except through the necessary air vent.

5. The tank outlet should be located in the bottom of the tank or otherwise designed so that the complete draining

of the tank may be assured.

6. Tanks requiring venting, to the exterior of the vessel, of gases accumulated in the tank, and to facilitate emptying of the tank by suction pump-out devices shall have the vent so located as to minimize the inboard return of odors and shall be so installed and designed as to prevent the intake of water into the tank through the air vent.[b]

a. Disposal of such receptacles or their contents into the waterways are in violation of the Municipal Code, and the shore disposal facilities are not designed to accommodate such materials.

b. Special attention may be required for sailboats since operations such as heeling pose special conditions.

7. By-pass fittings, mechanical or functional, by which an operator can

selectively discharge untreated sewage into the waterway, shall provide positive closure and provisions for sealing by the attachment of a fastener which cannot be removed without evidence thereof.

8. The retention device shall be non-portable, except for vessels as hereinafter specified, and shall be equipped with the necessary pipes and fittings conveniently located for suction pump-out at shore-based facilities.

9. Fittings intended for use in emptying holding and retention tank devices shall be designed to receive an insert tube capable of friction fit in the inside diameter of a 1-1/2 inch N.P.S. Schedule 40 pipe. Said fitting shall, in addition, be designed, constructed, and/or equipped to assure a liquid tight closure during normal operation of the watercraft, afford no obstruction to the flow of sewage, shall be cleanable, and shall when necessary

be designed to prevent the discharge of static electricity. Fittings intended for use in emptying holding and retention tanks shall be permanently and legibly marked with the word "WASTE." If the cover is detachable, then both the cover and fitting shall be so marked.

10. Portable retention tanks shall be permissible on Class A and Class 1 power boats (Coast Guard Classification, i.e.,not exceeding 26 feet) and sailboats where space considerations and hull shape precludes the use of nonportable facilities as specified in section 8. In this case, the detachable compartment shall be of sufficient capacity to retain the wastes for shore disposal, and shall not be designed with the intent of being disposable.

363-A

GUIDELINES
For Judging the
ACCEPTABILITY of RETENTION TANK EQUIPMENT

CHICAGO HARBOR POLLUTION CODE

CITY OF CHICAGO
RICHARD J. DALEY, *Mayor*
DEPT. OF THE PORT OF CHICAGO
Executive Offices—Navy Pier
CHICAGO, ILLINOIS 60611

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2. Materials used, including hose connections, shall be capable of resisting corrosive action of chemicals intended for use in connection therewith, and the waste material to be deposited therein, as well as the corrosive action of fresh and/or salt water.

3. Materials used, including hose connections, shall be durable and structurally sound enough to withstand normal stress incident to installation, and operation of a vessel such as vibration, pitch, roll, shock, temperature and such other conditions of use normally encountered in watercraft operation.

4. Material used, and method of fabrication or construction of the tank, should be such as to prevent the leakage of its contents and the escape of any gases therefrom, except through the necessary air vent.

5. The tank outlet should be located in the bottom of the tank or otherwise designed so that the complete draining of the tank may be assured.

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8. The retention device shall be non-portable, except for vessels as hereinafter specified, and shall be equipped with the necessary pipes and fittings conveniently located for suction pump-out at shore based facilities.

9. Fittings intended for use in emptying holding and retention tank devices shall be designed to receive an insert tube capable of friction fit in the inside diameter of a 1½ inch N.P.S. Schedule 40 pipe. Said fitting shall, in addition, be designed, constructed, and/or equipped to assure a liquid tight closure during normal operation of the watercraft, afford no obstruction to the flow of sewage, shall be cleanable, and shall when necessary be designed to prevent the discharge of static electricity. Fittings intended for use in emptying holding and retention tanks shall be permanently and legibly marked with the word "WASTE." If the cover is detachable, then both the cover and fitting shall be so marked.

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MR. STEIN: Thank you, Mr. Pavia.

Are there any comments or questions?

Thank you for a very excellent statement. Mr. Pavia and Mr. Vaughn have always been very cooperative with the water pollution control efforts, and I think it is fair to say without the Water and Sewer Department, at least on the lower end of Lake Michigan, we certainly wouldn't be this far ahead in getting the pollution program going, because they have provided a lot of the impetus and a good deal of the data on which we base the case.

MR. KLASSEN: This, Mr. Chairman, concludes the Illinois presentation. However, I just want to add that these two excellent reports, while they were presented by staff members, the man that is really in back of these I just want to recognize is here, Commissioner James Jardine of the Chicago Department of Water and Sewers.

MR. STEIN: Thank you, Jim.

MR. KLASSEN: Thank you.

MR. STEIN: At this point we will stand recessed for lunch until 2 o'clock.

(Whereupon, at 12:30 o'clock p.m., a luncheon recess was taken.)